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WRINGER ARM

A Report of Twenty-Six Cases

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BOSTON

MANY of the terms describing entities in medicine depend largely on Latin or Greek for their derivation, so that one word is often a succinct descriptive expression of a recognized syndrome. It is of interest to note that occasionally a particular disease or accident becomes so intimately associated with its causative agent that an idiomatic, though not entirely scientific, term which soon becomes acceptable to the medical mind, is applied to it. Examples of the latter are frequent.

With the advent of the automobile came the chauffeur's fracture which, in turn, has become more and more of a rarity with the invention of the self-starter. Similarly, the electric waxer, the mechanical loom and the silent policeman have resulted, respectively, in the now relatively infrequent occurrence of housemaid's knee, weaver's bottom and policeman's heel. At present, riveter's wrist, tennis elbow, baseball finger, bumper fracture, park-bench paralysis and writer's cramp have become unofficial diagnostic terms. Into this same category falls one more, previously undescribed, which I shall designate as "wringer arm."

In the days when clotheswringers were turned by hand, a pinched finger or a crushed thumb was often encountered, but seldom was an entire arm drawn between the rollers. With the progress in mechanization, however, the invention of the electric clotheswringer so appealed to the public that over thirteen million of these machines are estimated to be in use in the United States.† One result of this popularity has been a series of accidents to small children. The steady increase in the frequency of such arm injuries parallels the increase in sales (Table 1).

The turning rollers fascinate the child and lure him to closer investigation. In spite of the numerous safety devices which have been developed on some wringers, there are none to prevent the fingers' being caught. Once they are engaged, the entire arm is usually pulled between the rollers so suddenly and with such force that the child is unable to extricate himself. He is found screaming with pain and from fright, with the rollers churning away in his axilla. If the mother keeps her head

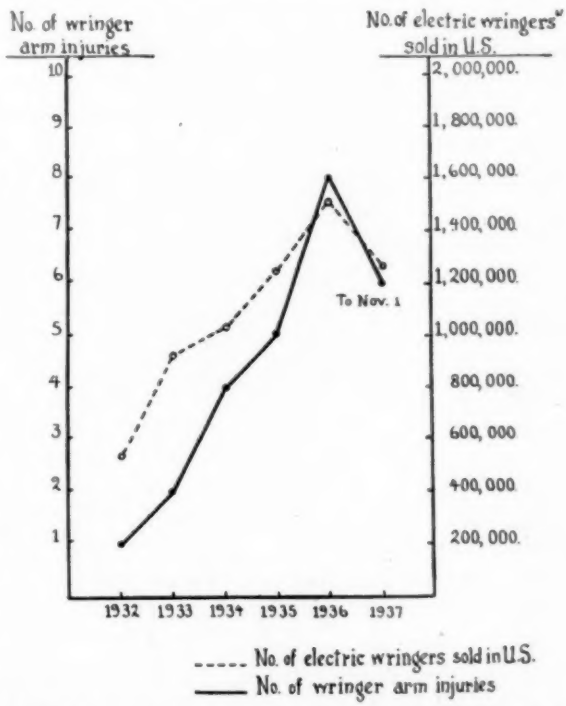

Table 1. *The frequency of wringer arm injuries shows the same general curve as that of the number of electric wringers sold in the United States.*

she will strike the safety release and liberate the arm. Very frequently, however, her first impulse is to reverse the direction of the rollers and exert countertraction upon the child, thus subjecting the arm to a second crushing.

This accident may occur in all age groups, but is most frequent in early childhood. In this series

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of 26 cases, the age of the patients varied from one to seven. Twenty-two accidents occurred in children between two and five. Over twice as many boys as girls were injured.

The extent of the injury is variable, dependent upon the speed of the machine, the gap between the rollers and the length of time that the arm is subjected to crushing. If the child is young the injury may be less severe on account of the elasticity of the soft tissue and the flexibility of the ligaments and joints. In none of the cases in this series were there demonstrable nerve injuries. There were minor fractures in only 2 cases, a green-stick fracture of the ulna, and a subperiosteal crack in the proximal phalanx of the fifth finger. The primary trauma in every case was to the skin, subcutaneous tissues and muscles. In each instance there were marked ecchymosis, edema of the subcutaneous tissues and abrasions of the skin. Three patients received lacerations which required suturing (Figs. 1, 2*A* and 2*B*). In several others there were diffuse hematomas beneath the skin or in the muscles. One of the hematomas required aspiration; the others gradually resolved. In the 7 most severely injured patients there was sufficient trauma to cause necrosis of the skin and underlying tissues. After these areas sloughed, plastic surgery was required for repair of the defects.

Because of the infrequency of this accident in the same home or in the same neighborhood, there is fortunately no standard home remedy that is employed before the doctor is called. In reality, witnesses to this accident generally think that the injury is much more severe than it actually is. Because of the parents' concern, the patient is usually seen by the doctor from fifteen minutes to an hour after his injury. At this time he has usually recovered from the shock of the accident. Even at this stage, the arm is apt to be markedly swollen, with many abrasions distributed over the injured portion (Fig. 1). The intact skin is usually blotchy and shows evidence of interstitial hematomas, edema and areas of residual ischemia caused by injury to the vessel walls. In some cases there is definite subcutaneous crepitation. This is thought to be caused by destruction of the cell walls and bleeding in the fatty layer. It is not, as might be supposed, produced either by air beneath the skin or by injury to the bone. It must be emphasized that the extent of the injury to the soft parts cannot be properly evaluated at this first examination, so that the prognosis at this time must be guarded. Examination for fracture at the initial examination is difficult because of the swelling and tenderness, so that in every case an x-ray photograph should be taken. If a fracture exists, extreme care must be used in the application of splints to avoid an ischemic paralysis. In the 2 cases of fracture in this series the associated injuries to the soft parts were of more importance and required more attention than the fractures, so that no splints were applied.

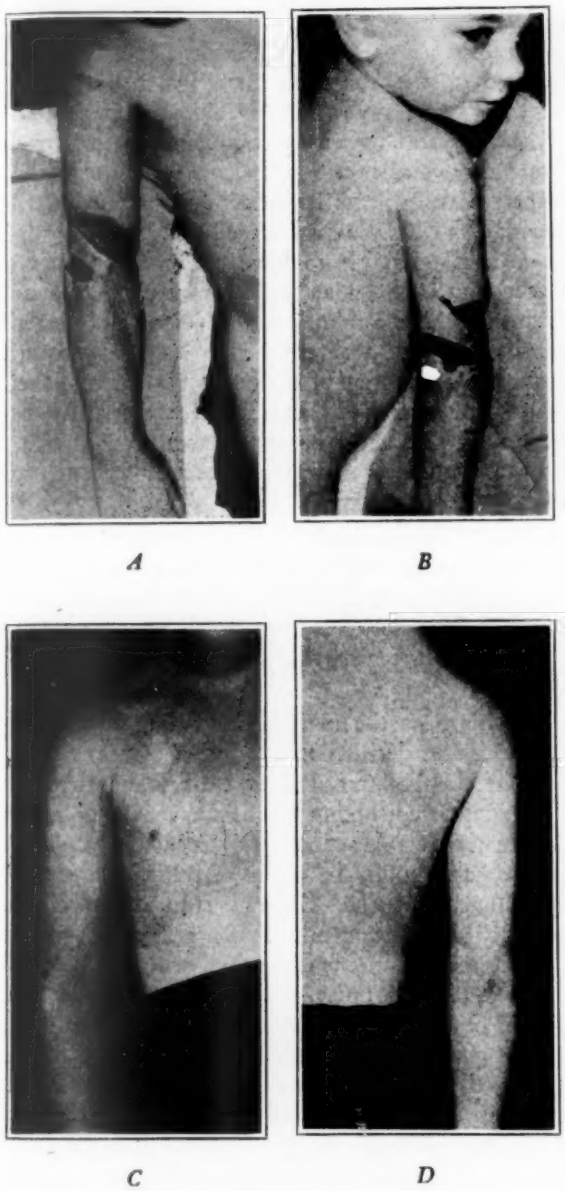
The treatment of the fresh injury differs from the treatment of one that is several days old. If the patient is seen shortly after the accident the arm

Figure 1. *Case 1, a boy of twenty months. The photograph shows the marked edema and ecchymosis of the right arm only two hours after injury. A bandage covers a small laceration of the thumb.*

must first be immobilized either by a sling or by sandbags. The edema must be reduced as rapidly as possible. To accomplish this, iced packs of concentrated magnesium sulfate are applied continuously for the first twenty-four hours. For the second twenty-four hours, these packs are alternated every two hours with hot magnesium-sulfate packs. If there has been extensive maceration of the skin, dry heat may be used alternately with the cold packs. A rigid aseptic technic must be carried out in the treatment of the abrasions. These should be properly cleansed with antiseptic solutions and kept from contamination. This is of extreme importance because sepsis developing in this devitalized tissue may endanger the patient's life from a resulting septicemia. In this series, 6 patients treated ineffectually for several days at home entered the hospital suffering from a septicemia due to a hemolytic streptococcus. All recovered, but in

each case the infection had destroyed tissue over the arm and thus delayed the local healing.

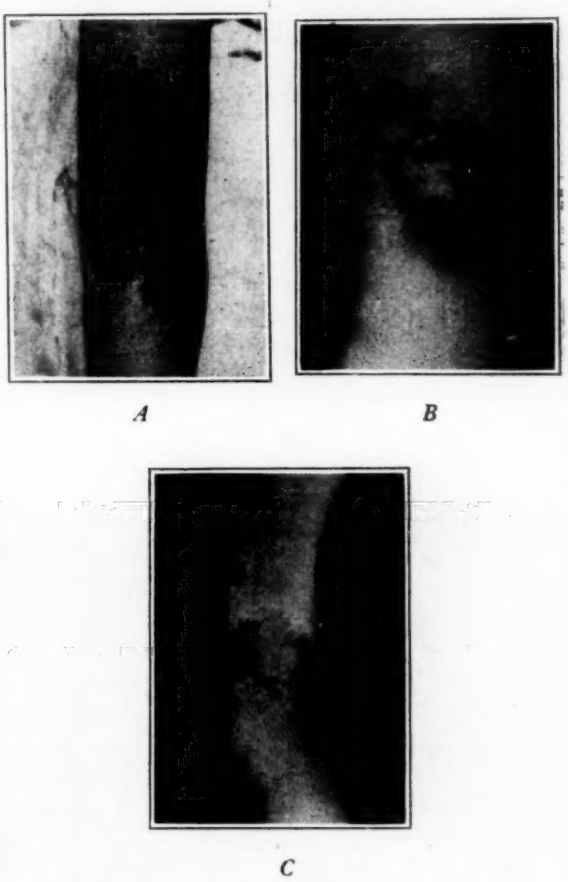
When the patient is seen several days after the accident, he may be found to be recovering from the injury without sequelae. More often, however, two complications are found, alone or in combination: the entire arm is swollen, red and painful, with evidence of diffuse cellulitis, or an area of necrosis has developed. The child is usually sick, and the temperature is elevated. When cellulitis exists, packs of hot normal saline or boric acid are applied continuously until the infection subsides. The patient's general condition is improved with transfusions and intravenous injections of glucose and saline. In recent cases in this series that were infected with hemolytic streptococci, sulfanilamide has been given with good effect. In all cases with cellulitis of the arm but without necrosis, the infection cleared with these measures. In cases with necrosis further treatment was necessary to effect healing.



A *B*

C *D*

Figure 2. *Case 2, a boy of three years. Seen six days after the accident. Photographs A and B, taken six days after the accident, show a spiral laceration of arm with necrosis of the edges of the incision. Photographs C and D show the result six months after excision of the necrotic edges and suturing of the freshened incision; function was normal.*



A *B*

C

Figure 3. *Case 3, a boy of four and a half years. Photograph A shows the necrotic area above the elbow, three days after the accident. Photograph B shows the result eight days after a razor graft had been applied; note the residual ecchymosis of surrounding tissue from the original trauma. Photograph C shows the result six months after grafting.*

Necrosis with sloughing of the devitalized tissue is slow in developing, making it almost impossible to judge at the first examination the severity of the injury to the soft parts. If the treatment outlined for fresh injuries is followed closely with the view to the reduction of the edema and the reestablishment of the normal circulation, a minimal

amount of sloughing will occur. In this series, necrosis occurred in 7 cases. Only 1 of these was seen shortly after the accident. The other 6 patients came to the hospital for treatment as late as six weeks afterward. When a dusky

A

B

Figure 4. *Case 4, a boy of six years. Photograph A, taken three weeks after the accident, shows the extensive ulceration of the inner aspect of the upper arm and the axilla, with limitation of movement at both the shoulder and elbow. Photograph B shows the result four weeks after razor grafting; function has returned to normal.*

ecchymotic area appears to be growing blacker, the ice packs are discontinued and hot packs are substituted. Light massage and passive movement may be indicated in selected cases. Although it has not been used in this group, the peripheral suction-pressure pump may be of value in aiding the circulatory return.

If the injured tissue does not respond to the efforts made to revive it, the gangrenous portion will soon become demarcated from the viable portion. Figures 3*A* and 5*A* illustrate the typical appearance of an early slough. The edges will gradually retract from the normal skin, and the dead tissue will slowly fall away. It is unwise to perform an operative debridement at this stage because of the surgeon's inability to judge the depth of the slough: he may either remove it incompletely and thereby accomplish little, or needlessly remove or injure normal viable tissue. Continued soaks in sterile saline or boric acid will accomplish the removal effectively. During this stage it is advisable to have a tourniquet and a sterile tray with gauze and arterial clips at hand. Although the thrombosis of the vessels is the cause of the necrosis, a severe hemorrhage may result from the sloughing of a deeper vessel that is incompletely occluded. In all these cases the patient's blood should be typed and cross-matched with a suitable donor in preparation for such an emergency.

After the dead tissue has been removed, the site of the necrosis usually becomes cratered and covered with a thin layer of pale pink, chronically infected granulations. Figure 5*B* shows the appearance of the arm shortly after removal of the slough.

At this time the method for filling in this defect must be decided upon, and a correct evaluation of the amount and type of tissue that has been destroyed becomes necessary. In order to ensure the best functional and cosmetic result, all this tissue should be replaced. Replacement of subcutaneous tissue, fat and skin, if necessary, must be done by means of either a pedicle or an advancement flap of the neighboring tissue. To carry out either of these procedures at this time would be unwise because of the lowered resistance of the patient and of the decreased vitality of the skin in the immediate vicinity of the defect. When a flap is used, the low-grade sepsis which is almost invariably present in the recipient site causes a separation of the suture lines and a loss of part or all the flap. For this reason it has been found advisable to cover the raw surface with epithelium in the form of thick razor grafts. If contractures develop that cannot be remedied by exercise and massage, a pedicled flap can be utilized at a later date when it is possible to carry out the procedure in an aseptic field and at a time more advantageous for good healing. Case 5 (Fig. 5) shows the result of an extensive slough over about one third of the arm. It appears that razor grafts on this site would not have sufficed to have prevented late contractures from the scar. Lymphedema of the

hand and limitation of movements were expected. However, neither in this case nor in any of the others in this series has it been found necessary to do a subsequent graft. These results were exceptionally fortunate, and severe injuries such as those in Cases 4, 5 and 6 are likely to require the replacement of the subcutaneous tissue.

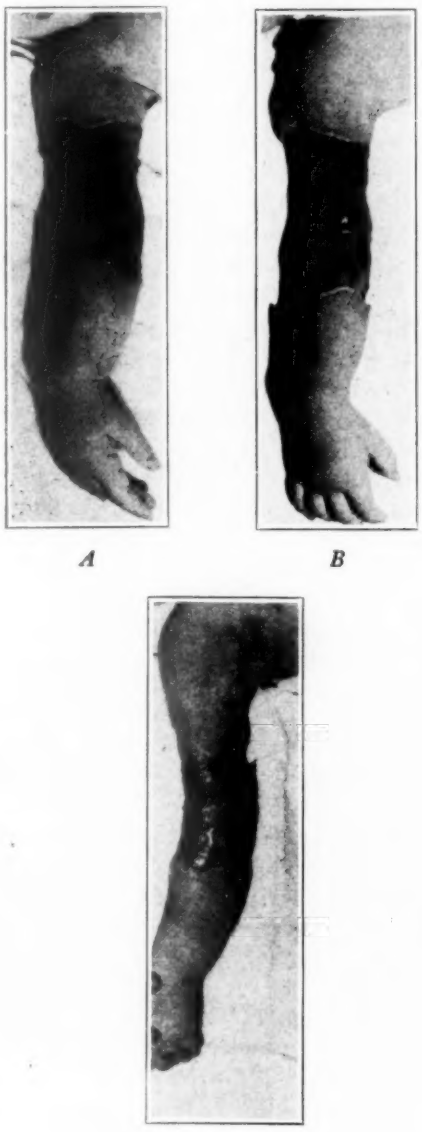


Figure 5. *Case 5, a girl of sixteen months. Photograph A, taken four days after the accident, shows the extensive area of necrosis which completely encircled the arm; note the ecchymosis and edema distal to the slough which was beginning to pull away from the upper portion of the arm. Photograph B shows the granulating bed after the necrotic area had been removed; note the residual bruising over the forearm just proximal to the wrist. Photograph C shows the result fourteen days after razor grafting; the new skin is still irregular and shiny.*

The technic of razor-grafting for unhealed burns has recently been described by the author.[1] The same principles apply to crushing injuries, but certain variations are necessary to produce a good result. It must be remembered that there has been an extensive injury to the tissue surrounding the granulating area to be covered by the grafts (Fig. 3*A*, 4*A* and 5*A*). Because of this, the blood supply to the raw area is reduced and lymphatic drainage is impaired, so that the recipient site becomes similar in many ways to that caused by an electric burn. The granulations are slow in forming and in becoming clean enough for grafting. To ensure a successful take of the graft it is necessary that the preoperative treatment be centered upon hastening the formation of healthy granulating tissue. The preoperative routine followed at the Children's Hospital is as follows:

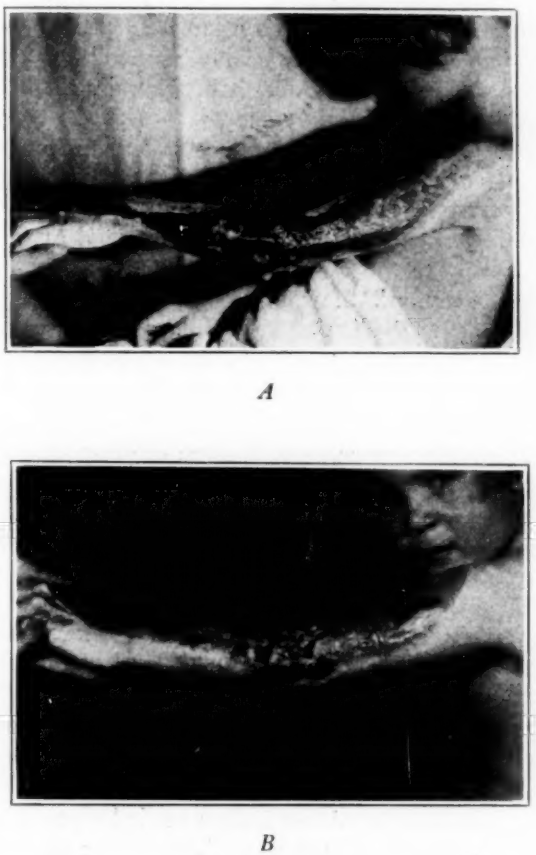


Figure 6. *Case 6, a girl of six years. Photograph A, taken six weeks after the accident, when she was seen for the first time, shows the extensive raw area resulting from a combination of pressure necrosis and burn, as this patient caught her arm in a hot mangle. Photograph B shows the result four weeks after the application of razor grafts. This patient is still under treatment.*

The arm is given a daily bath of hypertonic saline for thirty minutes. The raw area is then

covered by Tulle Gras — wide-meshed paraffined gauze which has been impregnated with vaseline containing 1 per cent compound tincture of benzoin, and which has been autoclaved for forty-five minutes under 15 pounds' pressure. Over this gauze are placed gauze sponges soaked in Eusol, composed of boric acid 12.5 gm. and chlorinated lime 12.5 gm. in 1000 cc. of water, which is allowed to stand for twelve hours and is then filtered. It is usually too powerful to apply undiluted, so that it should be emulsified with an equal amount of mineral oil. Dry gauze is placed over these dressings, which are held in position by a firmly applied elastic bandage. It is important that the arm be bandaged tightly enough to keep the granulations flattened, but not so tightly as to impair the circulation. In order to prevent the hand and fingers from becoming edematous, the elastic bandage should be started at the fingertips and carried up evenly to the axilla. If only a section of the arm is covered, the part distal to the bandage will become swollen and painful. In addition to these dressings, the arm should be immobilized with padded splints or sandbags. Plaster casts are to be avoided.

When the raw area has become cherry-pink and the patient is sufficiently improved to withstand the operative procedure, the case is ready for grafting. The patient is given a general anesthetic, and both donor and recipient areas are cleansed with soap and water, alcohol, and ether. The recipient site is prepared first. The granulations, together with their fibrous tissue base, are removed down to the normal subcutaneous tissue. Bleeding is controlled by arterial clips and by hot saline packs. Ligatures and all other foreign material are to be avoided.

A pattern of the defect is then made by pressing a dry, unbleached cotton cloth on the recipient site, when its contour will be outlined by a blood stain. The cloth is then inverted and covered with sheets of Tulle Gras. The grafts are cut and laid raw side up on the meshed pattern so that the edge of each will overlap its neighbor by 1 or 2 mm. The entire pattern is then transferred to the recipient area. The edges of the mesh pattern are sutured to the normal skin to prevent the grafts from being displaced when the dressing is applied. A pressure dressing is next applied over the grafts. A gauze pad exactly the size and shape of the pattern is fixed evenly and securely to the recipient site by an elastic mesh bandage. Over this is placed more gauze, held in position by elastic adhesive and elastic crepe bandage. Here also the bandage should begin at the fingertips to avoid edema of the most distal portion. The arm is then immobilized in splints, care being taken to prevent rotation of the shoulder.

The dressings are first changed on the seventh or eighth postoperative day. By that time the area is usually completely healed, but protective dressings are needed for another week. Then active physiotherapy and occupational therapy may be started. Even in this age group the long immobilization results in a marked stiffness of the joints and muscles. The degree of impairment of function is much greater than that usually found where burns or fractures have been immobilized for the same length of time. The reason is not clear: it may be a fibrosis in the muscles resulting from either a mild degree of ischemia following injury or the organization of a hematoma. Exercise under water is of great benefit for hastening normal mobility, and may easily be carried out at home in the bathtub. Within six months the motion of all joints should be normal. The subcutaneous tissue proliferates beneath the graft and obliterates the depression caused by the original loss of tissue. If the grafting has been properly done, the surface smooths out and gives a good cosmetic effect.

SUMMARY

A series of 26 wringer-arm injuries is presented.

The immediate and late treatment of these injuries is outlined.

The variations in the technic of razor grafting used are briefly discussed.

300 Longwood Avenue.

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THE APICAL CHEST LEAD AS THE CHIEF AID IN THE DIAGNOSIS OF CORONARY OCCLUSION

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BOSTON

THE most definite advance in electrocardiography in many years has been the introduction of the recording of the electrocardiogram from lead points on the chest over the heart. For renewing the work in this subject in its clinical and experimental applications, we are indebted to Wolferth, Wood and their associates.[1, 2, 3] The skepticism of five years ago as to its value in the diagnosis of coronary thrombosis gave way later to some overenthusiasm and the attribution to the chest lead of an ability to give specific information not possessed by the standard limb leads. As Roth[4] has pointed out, there has been a tendency to disregard some of the obvious

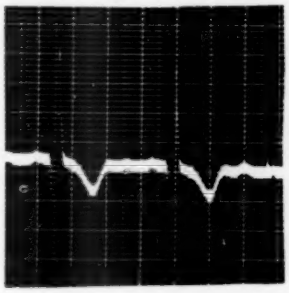

Figure 1. *Normal Lead 4, with the right-arm electrode placed over the apex of the heart and the indifferent electrode on the left leg.*

abnormalities in the standard leads in this concentration on the new precordial records. It was with this idea in mind that we chose the title of this paper, and for illustration we present a series of cases in which the chest lead was the *chief* electrocardiographic aid, while admitting that the limb leads were by no means always normal.

Until June, 1937, the routine connection of the electrocardiograph for the chest lead at the Massachusetts General Hospital was through the Lead-2 wires—the right-arm electrode placed over the cardiac apex and the left-leg connection used as the indifferent electrode. This lead will be called Lead 4 in our discussion (Fig. 1). At present the left-leg electrode is placed at the apex and the left arm is the indifferent lead point. One of the cases reported here shows a chest-lead electrocardiogram taken with this technic.‡

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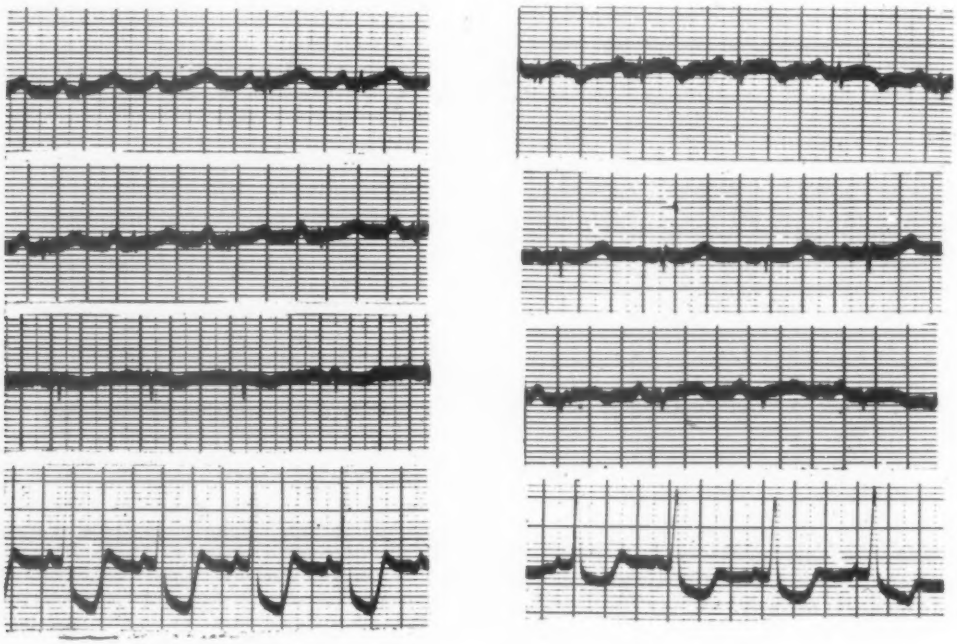
‡This connection of electrodes reverses the polarity and the T wave is normally upright. The left leg is perhaps a somewhat better indifferent lead point than the left arm, and is now used at the Massachusetts General Hospital (March, 1938).

Ninety-two patients with coronary thrombosis, recent or old, were seen by us; both standard and chest leads were recorded, and 16 cases were selected as showing in electrocardiograms evidence in Lead 4 unobtainable in the axial leads. In 1000 consecutive electrocardiograms at the Massachusetts General Hospital, 16 cases of coronary thrombosis were found, 3 being selected as representative of the value of Lead 4, and 2 other cases were found in the hospital files. There were therefore 21 cases in which Lead 4 was at some time in the course of coronary thrombosis the chief aid to the diagnosis. In this entire series the infarct was of the anterior type, as determined by the electrocardiogram, and our observations refer at this time to this type only. In 2 cases autopsy study was possible and was confirmatory.

The cases were divided into two groups, Group I comprising 14 in which Lead 4 showed the only positive evidence of *acute* coronary occlusion. In 12 cases changes were found in the conventional leads of the electrocardiograms that suggested the diagnosis but were insufficient to clinch it. They consisted of diphasic T waves in Lead 1 in 8 cases, associated with a very slight elevation of the S-T segment in half of them; low T waves and isoelectric T waves in Leads 1 and 2 in 2 cases; a sagging S-T segment in Lead 1 in 1 case; and bundle-branch block in 1. Four patients had had digitalis, and 11 had suffered from angina pectoris from 2 weeks to 2 years before the most recent coronary occlusion.

The changes noted in Lead 4 of Group 1 were found at intervals varying from twelve hours to eight days after the occlusion. There were 8 cases in which the Q wave was absent and in which the S-T segment was displaced downward; the T wave then went above the base line in most cases in a diphasic form. Three tracings showed upright T waves in Lead 4 and in 2 of these the Q waves disappeared three and six weeks later respectively. The T wave was diphasic with an early inversion in 1 case, and in 2 the Q waves were absent but the T waves were normal. These observations suggest that the commonest early change is a diphasic T wave with low origin of the S-T segment and absent Q waves, although it is not unusual to find upright T waves with the Q waves disappearing at a later time.

There were placed in Group II 10 cases in which Lead 4 showed the only definite evidence of a *previous* coronary occlusion. Six of these had changes in the conventional leads that might have suggested a previous occlusion, but they were indefinite. They were as follows: 3 tracings with sagging S-T intervals in Lead 1; 2 with diphasic T waves in Lead 1 and isoelectric T waves in Lead 2; and 1 with a low T wave in Lead 1. One patient had been taking digitalis, and 5 patients had had angina pectoris for from two weeks to six years.



A *B*

Figure 2. *Case 1.*
A. Six days after occlusion.
B. Fourteen days after occlusion.

The changes found in Lead 4 followed coronary occlusions in 2 cases at intervals of one and three days respectively, and the intervals in the remaining cases varied from six weeks to two years. The reason for including the 2 acute cases in this group is that the axial leads had returned so far toward normal as to be much less diagnostic than was the chest lead. The commonest finding was an upright T wave in Lead 4 in 5 cases, 2 of which had an upright Q wave. In 1 case there was a high origin of the S-T segment. The Q wave was absent in 2 cases, 1 of which was associated with an early inversion of the T wave. These findings indicate that the T-wave changes persist longer than do the abnormalities of the Q wave; however, there were cases showing that this is not necessarily true.

Three of the Group II cases showed abnormalities in Lead 4 in the presence of essentially negative conventional leads, in tracings taken eight, twenty and thirty days after the acute occlusion. These cases were also included in Group I as showing the most definite evidence of coronary occlusion in Lead 4. Two cases showed a diphasic T wave of low origin with the upward phase predominating —1 with an absent Q wave and 1 with a small upward Q wave. In the remaining case the Q wave was absent and there was an early inversion of the T wave. The most recent electrocardiogram of the case with the upward Q wave shows an absence of the Q wave eleven months after the acute coronary occlusion.

There were 2 cases which showed points of interest and importance. The electrocardiogram of the first patient showed normal conventional and chest leads two years after a coronary occlusion, despite the autopsy finding of an old myocardial area of infarction involving the interventricular septum and an area of the left ventricle in the region of the apex. The other patient had been suffering from angina, caused by the slightest exertion and lasting for unusually long periods. After several weeks an electrocardiogram was made and a definitely abnormal Lead 4 was found. Eight days later he showed definite clinical evidence of an acute coronary occlusion with a fall in blood pressure, pericardial friction rub and collapse. Ap-

parently he had been suffering from an impending coronary thrombosis or myocardial anoxemia, the only definite evidence of which was shown in the high origin of a very tall T wave in Lead 4.

CONCLUSIONS

Serial three-lead electrocardiograms, taken during the course of acute coronary closure, will in almost every case furnish adequate diagnostic evidence of the disease. If, as is often true in non-hospitalized patients or in patients who have recovered from an acute attack, a single electrocardiogram must be relied upon for a definite diagnosis, the evidence from the limb-lead electrocardiograms is likely to be equivocal. Our figures indicate that in nearly 20 per cent of an unselected group of cases with old and fresh infarcts the direct lead from the cardiac apex greatly increased the specificity of the electrocardiographic information. This information is thus immediate. It is confirmatory of the clinical story, and is often of primary value in treatment and prognosis. Inasmuch as the evidence from Lead 4 may precede that from the limb leads or may persist after the latter has disappeared, the precordial lead should be routinely taken in all cases of coronary disease.

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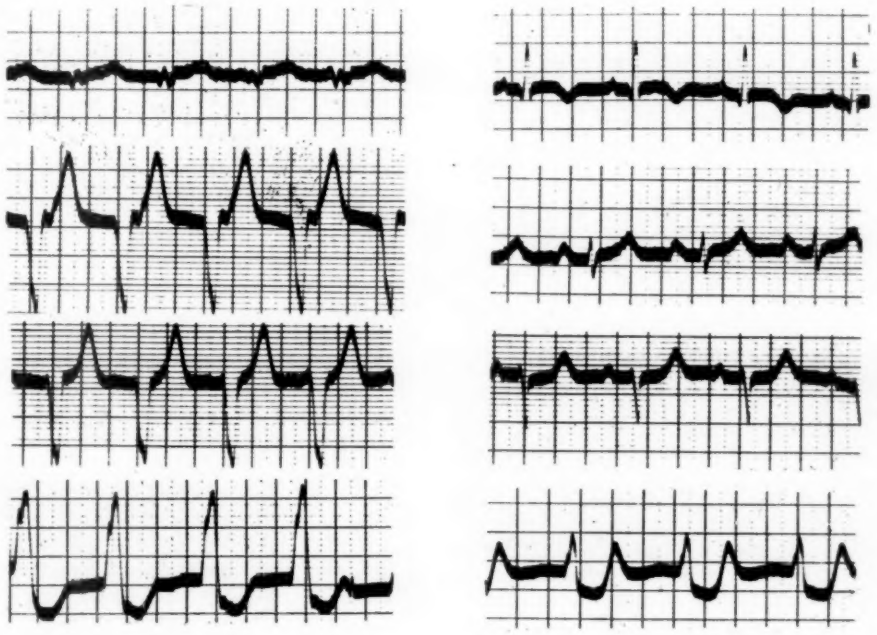
CASE REPORTS

Case 1. M. E., a 54-year-old woman, gave a history of dyspnea on exertion for many years. Five months before admission on January 18, 1935, she began having pressure in her chest and numbness in the left arm, caused by exertion and relieved by rest. Three days before admission she had a similar pain, which persisted. Physical examination showed marked gallop rhythm, cardiac enlargement, no murmurs or evidence of congestive failure, and a blood-pressure 140/85. Her temperature was 103°F., and the white-cell count was 16,400. After 6 weeks' observation she was sent back to her doctor improved.

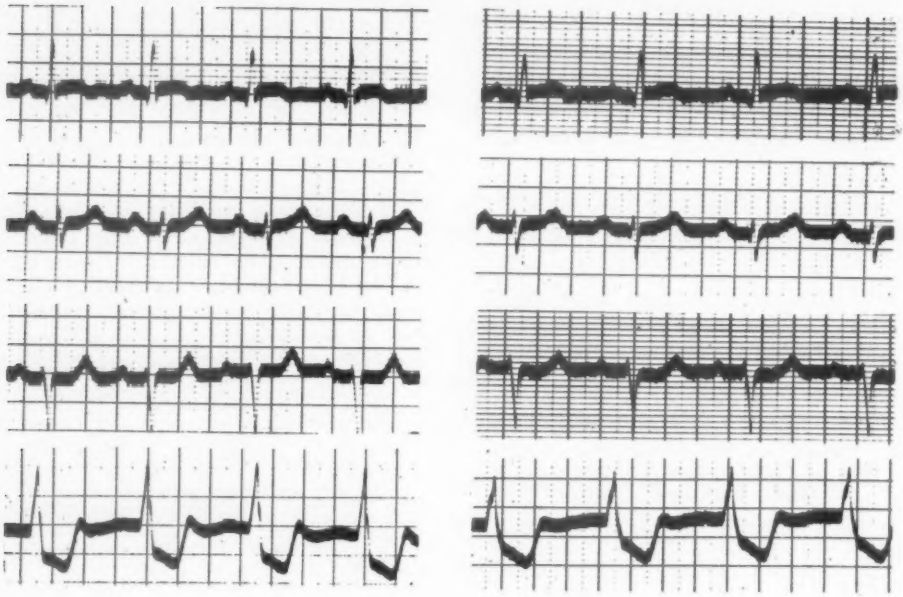


A *B*

Figure 3. *Case 2.*
A. Twelve hours after occlusion.
B. Two days after occlusion.

Figure 2*A* shows that six days after coronary occlusion the axial leads showed only low voltage as an abnormal finding. Lead 4, however, distinctly displayed the diagnostic evidence of anterior cardiac infarction through the displacement of the S-T segment and absent Q wave. The tracing taken fourteen days after the thrombosis (Fig. 2*B*) finally confirms Lead 4 by showing the characteristic inversion of the T wave in Lead 1.

Case 2. J. H., a 56-year-old man, had been in good health until 3 weeks before admission to the hospital, when he complained of tight low substernal pain, caused by walking and relieved by rest. Eight hours before his admission on April 6, 1937, he was awakened with severe constant low substernal pain, weakness, dizziness and sweating. His temperature was 101°F. There were no



A *B*

Figure 4. *Case 2.*
A. Three days after occlusion.
B. Eight days after occlusion.

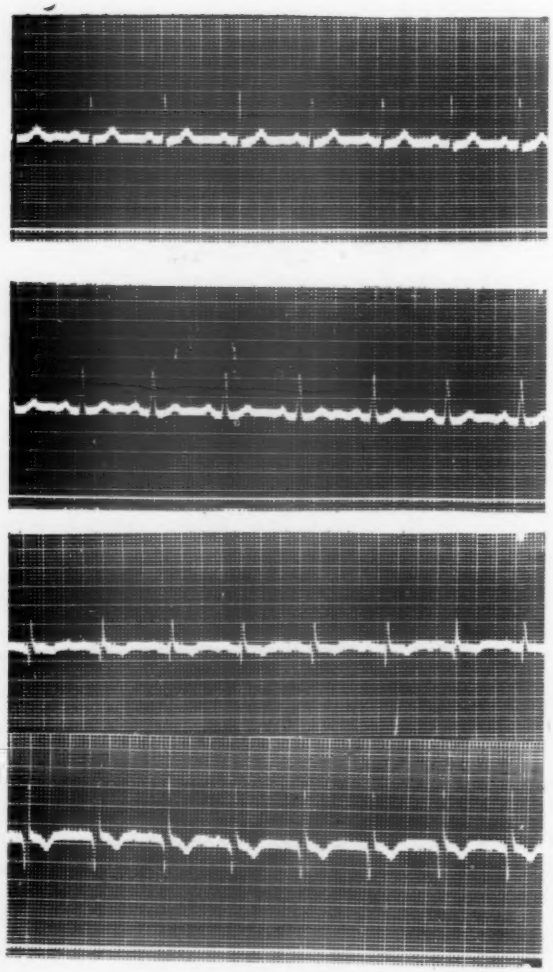


Figure 5. *Case 3. Eighteen days before occlusion.*

murmurs or congestive failure. The blood pressure on admission was 180/100, but in a few hours it fell to 120/78. The white-cell count was 14,000. After 3 weeks he was discharged to his family physician.

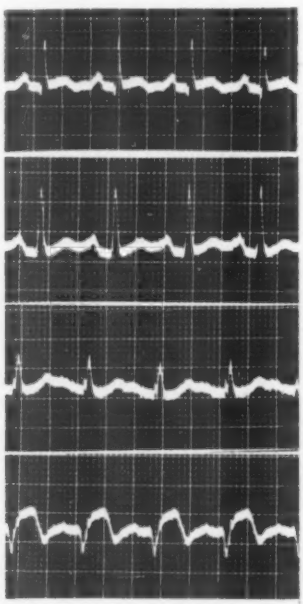


Figure 6. *Case 3. Forty-one hours after occlusion. This Lead 4 was made by the new technic, in which the left-leg electrode is placed over the apex of the heart and the indifferent electrode on the left arm.*

In Figure 3*A* all four leads are abnormal, but the diagnostic elements, so far as acute occlusion is concerned, are hidden by the bundle-branch block. However, Lead 4 is quite suggestive of anterior infarct. In two days (Fig. 3*B*) this was clear in both standard and chest leads.

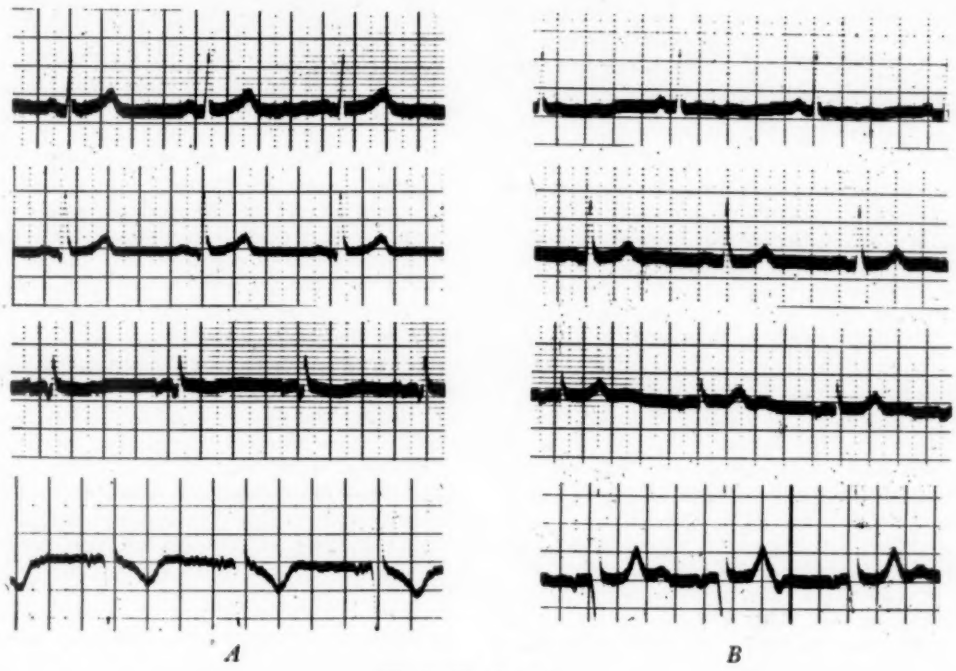


Figure 7. *Case 4.*
A. One year before occlusion.
B. Twelve hours after occlusion.

In the tracings taken three and eight days after the occlusion (Fig. 4*A* and 4*B*) the standard leads, while suspicious as to Lead 1, do not give the clear information of Lead 4, with its persistent abnormalities in S-T and Q phases.

Case 3. A. H., a 55-year-old man, was well until September 11, 1937; on that day while watching a tennis match he felt an oppression in his chest. An electrocardiogram taken shortly afterward was normal. During the next month, however, he had more chest pain on exertion, which was relieved by nitroglycerin. On September 30

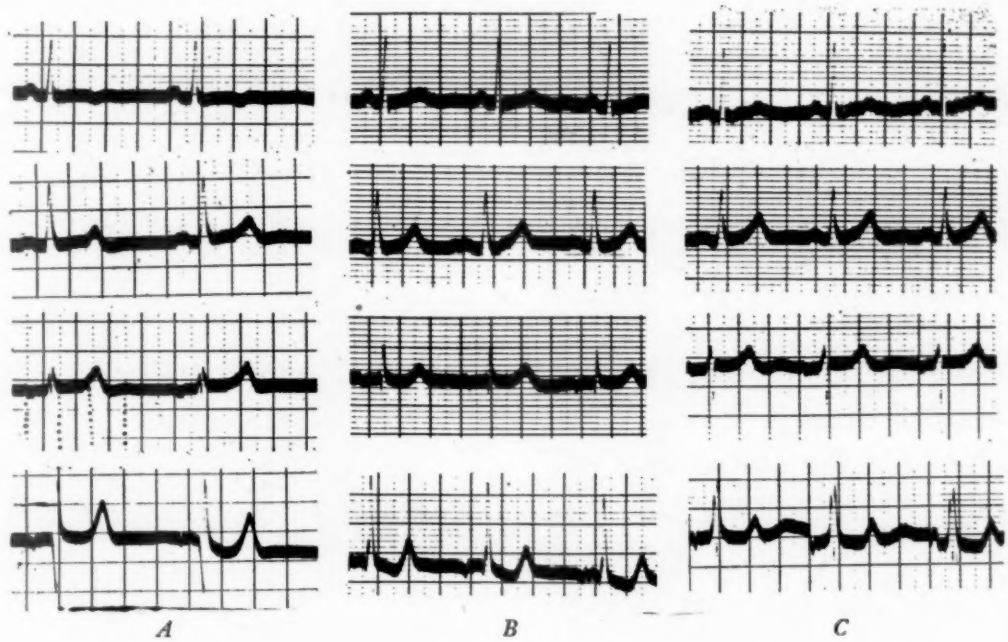


Figure 8. *Case 4.*
A. Six days after occlusion.
B. Twenty days after occlusion, the conventional leads having returned to normal.
C. Five weeks after occlusion.

after dinner he had a severe burning pain over the sternum, radiating down both arms. His blood pressure fell from 140/80 to 100/60. His pulse, which was 80 at first, rose to 104 and the temperature to 100.4°F. 2 days later.

An electrocardiogram taken September 12, 1937 (Fig. 5), shows no abnormality in any of the complexes except a very slight slurring of the QRS in Lead 2. The tracing taken on October 2 (Fig. 6), forty-one hours after the onset of the occlusion, shows a suspicious elevation of the S-T segment in Lead 1, but an entirely characteristic picture of anterior occlusion in Lead 4. It should be noted that Lead 4 was taken with the more recent technic, and therefore has a reversed polarity as compared with the others here shown.

Case 4. J. K., a 36-year-old man, entered the hospital on April 7, 1937, complaining of dyspnea and precordial pressure on exertion, following a severe chest pain 2 years previously, associated with pain in the left arm. On the day before admission he was awakened by a severe chest pain, with radiation into the left arm, which lasted for 1 hour. His temperature was 100°F. The white-cell count was 8800, the blood pressure was 135/80, and the heart sounds were of good quality. A 7-foot heart plate showed the heart to be at the upper limits of normal size. A blood Hinton test was negative. After 4 weeks the patient was discharged to his home, where he was comfortable except for precordial pain on exertion. On June 10, 1937, he started to seek employment, but had to give up because of chest pain. After that time he had frequent, severe chest pains, and on June 13, 1937, he came to the Emergency Ward with the most severe pain he had yet experienced, with radiation into the left arm and the jaw. The heart sounds were distant, the blood pressure was 110/90, and the white-cell count was 10,000. He died suddenly the next morning.

Postmortem showed that the heart weighed 325 gm. Along the lower half of the interventricular septum and somewhat involving the anterior portion of the left ventricle at the apex, the myocardium and endocardium were dull steel-blue in color and somewhat thin. The main coronaries showed marked yellowish atheromas. Three millimeters beyond the descending branch of the left coronary there was an old occlusion. Five millimeters beyond the origin of the circumflex branch of the left coronary the artery was almost occluded, and 1 cm. farther along the closure was complete. The right main coronary artery showed recent occlusion.

Figure 7*A* cannot be considered diagnostic of coronary occlusion, in spite of the findings at autopsy indicating that an infarction of the apical and septal region of the heart had taken place one year before. Twelve hours after the second occlusion (Fig. 7*B*) Lead 1 was very suspicious, especially so when compared with an electrocardiogram taken on March 16. Moreover, the slightly inverted T wave in Lead 3 of the previous tracing had become upright, conforming to the pattern of anterior occlusion. Lead 4, however, showed the most marked change in the T-wave direction. Figures 8*A*, 8*B* and 8*C* are interesting as showing the return of the standard leads to normal, except for a slight left-axis deviation and a persistent abnormality in Lead 4. In this case a standard three-lead electrocardiogram taken only 20 days after an acute coronary thrombosis, and 2 years after another, was within normal limits, and the diagnostic features were confined to the direct chest lead.

270 Commonwealth Avenue.

THE SIGNIFICANCE OF THE WEAKLY POSITIVE ASCHHEIM–ZONDEK TEST

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BOSTON

IN THE routine Aschheim-Zondek tests for pregnancy as performed at the Boston City Hospital, the reports fall into three groups: positive, weakly positive, and negative. All tests are read by examining, microscopically, stained sections of the rats' ovaries. In the definitely positive and negative tests there is no doubt about the interpretation in our minds or in those of the patients' physicians. In the weakly positive cases, however, there is often uncertainty in the minds of all concerned, and we are asked whether the patient is pregnant. In order to clear up this confusion, we have followed through to a definite diagnosis 60 cases in which the report was weakly positive. In all the cases of miscarriage such a diagnosis was evident, either from gross observation or from microscopic sections of placental tissue. In all the other cases the diagnosis was confirmed by microscopic sections. The cases were without exception taken from the gynecological and obstetrical service of the Boston City Hospital. Many of them were observed and cared for by one (B. T.) of us.

In a positive test, we must remember, the immature female rat's ovaries respond either to two separate hormones or to one pituitary hormone in two different ways. The present weight of opinion is that there is a pituitary follicle-stimulating hormone as well as a pituitary luteinizing hormone. The first causes the growth of the ovarian follicles, and must be present before the luteinizing hormone can change the ripe follicle into a corpus luteum. In addition to these pituitary hormones there is the prolan which is found in pregnancy urine. It also causes the formation of corpora lutea in the immature rat ovary. This pregnancy-urine prolan is thought to be of placental origin, although it is so similar to the luteinizing hormone of the pituitary that its separate entity is not a certainty. It is this prolan that gives the positive Aschheim-Zondek test.

In the first two or three weeks following conception, injection of urine gives only a follicle-stimulating effect in immature rats. In other words, there is follicle growth without formation of corpora lutea. This is due either to the presence of the pituitary hormone or to the follicle-stimulating effect of a very small amount of pregnancy prolan. While this result cannot be read as a positive Aschheim-Zondek test, it is extremely suggestive of pregnancy if the patient is only a few days past her period. Following this early phase, enough pregnancy prolan is present in the urine to produce definite corpora lutea in the immature rat. There is an intermediate stage between the two extremes in which follicle growth is stimulated and there is luteinization of the follicle cells without the formation of a distinct corpus luteum. This is the weakly positive test. The same cycle is reversed when a fetus dies. Such a pregnancy may first have given a definitely positive test. As the trophoblast of the placenta degenerates the hormone diminishes, resulting in a weakly positive test. Thereafter the minute amount of prolan gives only a follicle-stimulating effect, and finally the test becomes negative.

It can thus be seen that in very early pregnancy a weakly positive test is the normal finding. In a woman with a twenty-eight-day menstrual cycle, the Aschheim-Zondek test when made six weeks from her last regular period should be definitely positive in a healthy pregnancy. The cases considered in this paper are those of women who were more than two weeks overdue, and so would have been expected to have had positive tests.

In several cases that have shown a weakly positive test we have concentrated the urine and obtained a definitely positive result. These turned out to be abnormal pregnancies, however. Concentration is therefore of no value in this type of work. If a patient does not have enough prolan to give a positive test with whole-urine injection, she has either a very early or a pathologic pregnancy.

Table 1. *Final Diagnosis in 60 Cases Showing a Weakly Positive Aschheim-Zondek Test*

DIAGNOSES	NO. OF CASES
Miscarriage	38
Tubal pregnancy	12
Dead fetus	5
Hyperplasia of endometrium	2
Tubo-ovarian mass	2
Hydatid mole	1
Normal pregnancy	0

The relative occurrence rates of miscarriage and of tubal pregnancy in Table 1 are of no significance, because the usual miscarriage prevents no diagnostic difficulty and does not receive an Aschheim-Zondek test.

One fact stands out prominently: in our final statistics no patient with a weakly positive test had

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a normal pregnancy. This in itself is of value in the treatment of threatened miscarriage. As such cases are apt to occur in the second and third months of pregnancy, a positive test at this time gives a good prognosis, while a weakly positive test gives a practically hopeless one.

From the miscarriages recorded here, and the great number that might be added were they tested, it is evident that with a weakly positive test the first probability is that one is dealing with a blighted ovum, or an unhealthy pregnancy which will terminate in a miscarriage. We see many patients with staining in the second and third months of pregnancy. We feel that in these cases an Aschheim-Zondek test is of prognostic value.

The next most important finding is the relatively large number of cases with weakly positive tests that proved to be tubal pregnancies. One would expect this when one considers the lesion of tubal pregnancy. The ovum is implanted in an abnormal and unhealthy environment, and its normal growth is impaired. Few tubal pregnancies continue very long without damage to the ovum, which soon loses its vitality, the physiologic secretion of the cells accordingly becoming less. Fortunately, in most cases local symptoms which suggest the diagnosis are present. While on the laws of chance a weakly positive test points to a poor intrauterine pregnancy, it can be seen from this series that tubal pregnancy is of sufficient frequency to require that it be carefully ruled out. As we all know, one of the dangers of tubal pregnancy is that the condition is so rare that the diagnosis is unlikely to enter the physician's mind. This test definitely suggests it as a possibility.

The 5 cases with dead fetuses could strictly speaking be classed as miscarriages. Four of these were in the last trimester. The test is of additional evidence in such cases, but is probably unnecessary for diagnostic purposes.

The weakly positive tests in the 4 nonpregnant cases, 2 of hyperplasia of the endometrium and 2 of tubo-ovarian abscess, are difficult to explain. We do know that estrogenic hormones are the essential cause of endometrial hyperplasia. This may be the result of an excess of the follicle-stimulating hormone of the pituitary. Furthermore, in the cases of tubo-ovarian masses where the ovary had been destroyed there may have been some castration effect on the pituitary. These 4 cases therefore suggest that the positive reactions were due to the presence of gonadotropic hormones of the pituitary.

The single case of hydatid mole is of interest in that the weakly positive test fits in with our findings in 2 cases of early chorioepithelioma. In these we found less hormone than is encountered in normal early pregnancy. This shows that while an extremely high hormone content of the urine is present in well-advanced cases of hydatid mole and chorioepithelioma, it is not present in the early stages. For the sake of the patient the diagnosis should be made, if possible, when the hormone is present in only small amounts.

SUMMARY AND CONCLUSIONS

Sixty cases that showed a weakly positive Aschheim-Zondek test for pregnancy have been followed to a definite diagnosis. None were included in which the last period was less than two weeks overdue. Cases up to eight months' pregnancy were included. In this series the majority of patients miscarried. In a relatively large number tubal pregnancy was found at operation. Four cases gave diagnoses other than pregnancy, and thus suggested the presence of abnormal amounts of pituitary hormones. No patient had a normal pregnancy.

From this it seems likely that after the first few weeks of pregnancy a weakly positive Aschheim-Zondek test indicates some abnormality. A miscarriage following an unhealthy pregnancy is the commonest sequela, and a weakly positive test with a clinical diagnosis of threatened miscarriage indicates a poor prognosis. Tubal pregnancy must always be carefully considered as a diagnostic possibility in this type of test.

A weakly positive Aschheim-Zondek test may be of as much value as a positive or negative one.

NEUROLOGIC MANIFESTATIONS OF SUBACUTE BACTERIAL ENDOCARDITIS

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BOSTON

THE central nervous system is frequently involved in the course of many well-known diseases in which the primary pathologic process is far removed from the brain. One such disease, subacute bacterial endocarditis, has a high incidence of neurological symptoms, and since these symptoms are not infrequently the first to occur, they may lead to the impression that the primary lesion is in the nervous system, and hinder rather than aid in arriving at the correct diagnosis. It is the purpose of this paper, first, to present 3 cases which gave us considerable difficulty in diagnosis, and secondly, to emphasize the significance of central-nervous-system manifestations in the early recognition of subacute bacterial endocarditis, as determined by an analysis of 100 proved cases admitted to the Boston City Hospital in the last twelve years.

Thayer[1] states in his monograph on bacterial endocarditis that occlusion of the larger cerebral vessels, or, more rarely, rupture of mycotic aneurysms with subsequent hemiplegia, is distressingly common. The former was present in 31 per cent of his 145 cases. Klemmer[2] reported a series of 6 cases which presented multiple neurological findings. Symptoms referable to the nervous system were observed in 25 per cent of DeJong's[3] cases. Blumer[4] found that headache was the commonest symptom, and that this was closely followed by vertigo, tinnitus, insomnia, irritability, extreme nervousness, delirium, somnolence, coma and convulsions; cerebral embolism was the cause of death in 44 out of 193 cases. Osler[5] reported 3 deaths from this cause out of a series of 10 cases.

CASE REPORTS

Case 1. A 27-year-old white man was admitted complaining of severe headache, blurring of vision, deafness in the left ear and muscular weakness on the left side. Three months before admission the patient had headache and malaise, accompanied by fever. Transient attacks of slurred speech were noted. These episodes were followed in short order by a siege of migratory arthritis, which periodically confined him to bed. He had had a cough productive of mucus for several months preceding admission, and had lost 20 lb. during his illness. Ten days before admission the right-sided headache became more severe, followed by drowsiness, blurring of vision, numbness of the left side and difficulty in using the left arm and leg.

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The past history was noncontributory except for an attack of acute rheumatic fever at the age of 14.

On physical examination the patient did not appear acutely ill. The temperature was 99°F., the pulse 100, and the respirations 20. The heart was not enlarged to percussion, and the rate and rhythm were normal. The second mitral sound was split, but no murmurs were heard. The blood pressure was 140/75. The nasal margins of the optic disks were obscured, and in the macular region of the left fundus there was a dull red area a few millimeters in diameter. No definite weakness on the left side could be demonstrated, but there were hypalgesia and hypesthesia of the skin on the left side. The deep reflexes were active and equal, and the plantar responses were normal. The abdominal and cremasteric reflexes were absent. There was difficulty in recalling words and dates and a definite tardiness of responses, but no actual aphasia.

Examination of the urine showed a very slight trace of albumin, from 4 to 6 white blood cells per high-power field and an occasional granular cast. The hemoglobin was 73 per cent (Sahli), the red-blood-cell count was 3,950,000 and the white-cell count 12,000. An x-ray of the chest and skull and an electrocardiogram were normal. The spinal fluid was under an initial pressure of 140 mm. of water. The fluid was clear and slightly yellow, and contained 200 cells per cu. mm. The globulin test was positive; the protein content was 84 mg., the sugar content 48 mg. and the chloride content 693 mg. per cent. The colloidal gold and Wassermann tests were negative.

During the first week's stay in the hospital there was no particular change in the patient's condition. The temperature remained normal. Re-examination after transfer to the neurological service 1 week after admission showed findings similar to those on admission, except that the heart seemed to be enlarged. The first sound at the apex was muffled, and a soft, systolic, non-transmitted murmur was heard in that area. The second pulmonic sound was accentuated. A small, blue-black, pea-sized and tender subcutaneous nodule was present in the left trochanter region. The patient complained of severe right-sided headache, accentuated on motion of the head. Marked tenderness to percussion was present in the right temporoparietal region. He was unable to read newspaper print at a distance of 35 cm. The margins of the optic disks were blurred and the nerve head appeared to be swollen. There was a slight paresis of the left external rectus muscle. The visual fields were normal. The weakness of the left side which the patient complained of on admission had developed into a definite left hemiparesis, with hemihypesthesia, atopognosis and astereognosis on the same side. A mixed type of aphasia involving both sensory and motor components was evident. The patient was originally left-handed but had been taught to write with his right hand. The deep reflexes were slightly more active on the left.

Re-examination of the spinal fluid at this time showed that it was under a pressure of 160 mm. of water. The fluid was clear and colorless and contained 48 cells per cu. mm. The globulin (Pandy) test was positive; the

protein content was 42 mg., sugar 53 mg. and chlorides 730 mg. per cent. Colloidal gold and Wassermann tests were again negative.

The difficulty in speaking became progressively worse, and the cardiac signs became more evident. Three weeks after admission there were definite physical signs of mitral and aortic valvular disease. The temperature was now of a picket-fence type, ranging between 100 and 103°F., with a corresponding tachycardia. Petechiae appeared in the left conjunctival sac and in the skin of the right wrist and abdomen. Blood culture, taken a few days before the appearance of the petechiae, was positive for *Streptococcus viridans*. The hemoglobin dropped from 72 to 48 per cent (Sahli), and the erythrocyte count from 3,950,000 to 2,770,000. The patient died 8 weeks after admission. Permission for an autopsy was refused.

The diagnosis was made difficult in this case by several factors. First, the development of the hemiparesis and aphasia was apparently of slow evolution, suggesting the expansion of a neoplasm. The changes that developed in the appearance of the optic nerve supported this diagnosis. Secondly, the temperature did not become elevated until a week after admission. Thirdly, sufficient attention was not paid to the history of the old rheumatic fever and the more recent "arthritis." Finally, the cardiac signs were not diagnostic on admission, and petechiae were not seen until almost three weeks afterward. The diagnosis was established by blood culture when the cardiac signs became evident.

Case 2. A 34-year-old, colored man was admitted with a history of a sudden onset of right hemiplegia and speech disturbance. A week before admission, while drinking a glass of soda water, the patient suddenly began to perspire profusely, felt faint and "shook violently." He thought he was going to die, and was aware that he could not speak or move the right side of his body. He was carried home, and was brought to the hospital 1 week later because there was no improvement.

One year before admission the patient suffered from occasional dizzy spells and was treated for high blood pressure. A few months later his eyes began to "pain and burn," and he was unable to read fine print. At the same time, vague aches and pains were present in his joints and muscles. Night sweats were frequent, and because of loss of weight, general malaise and lassitude it became necessary for him to stop working.

When 14 years old he had had severe joint pains, with episodes of chills and fever lasting several weeks. Otherwise the past history was noncontributory.

Physical examination revealed a well-developed and well-nourished man. The temperature was 102°F., the pulse 98 and the respirations 22. The patient was conscious and co-operative, but appeared confused and disoriented and had difficulty in speaking. The heart was enlarged on the left. The rate, rhythm and quality of heart sounds were normal. Presystolic and systolic murmurs were heard at the apex. The blood pressure was 136/100. There was no evidence of cardiac decompensation. There were a complete right hemiparesis and a mixed type of aphasia, with both motor and sensory components. The deep tendon reflexes were exaggerated, being more active on the right. Ankle clonus was elicited on the right. The abdominal and cremasteric reflexes were absent, but no pathologic reflexes were obtained. The gait showed shuffling of the right foot and staggering toward the right.

Examination of the urine on numerous occasions yielded a slight trace of albumin and a few hyalin casts. Blood studies showed a hemoglobin of 73 per cent (Sahli); the erythrocytic count averaged 3,750,000 and the white-cell count was 18,000. A blood Hinton test was negative. The spinal fluid was under an initial pressure of 250 mm. of water. The fluid was clear and colorless and contained 38 lymphocytes per cu. mm. The globulin test was negative and the protein content was 36 mg. per cent. Colloidal gold and Wassermann tests were negative. A second examination of the cerebrospinal fluid was made several days later, and the findings were the same as on previous examination except that the pressure was 170 mm. Blood cultures were positive for *Streptococcus viridans*.

There was no marked change in the patient's condition during his 3 weeks' stay in the hospital. There was intermittent fever, a few petechiae were observed in the right conjunctiva and fundus 5 days after admission, and the spleen became palpable. The patient was transferred to a state institution, where he died 4 months later. No autopsy was performed.

Because of experience with the preceding case, the diagnosis in this one was made promptly after admission to the hospital. The past history of rheumatic fever, the acuteness of the onset of symptoms and the localization of signs, reinforced by a positive blood culture for *Streptococcus viridans*, left no doubt as to the diagnosis. Syphilitic endarteritis was excluded by the negative serological tests on both the blood and spinal fluid.

Case 3. A 45-year-old, colored man was admitted complaining of double vision and generalized weakness following the extraction of a tooth. He was confused, disoriented, and hallucinated in the visual and auditory spheres.

The patient had enjoyed good health until 4 days before admission, when a few hours after the extraction of an abscessed tooth he felt generalized weakness. Three days later he was unable to walk, falling on two occasions and injuring his right shoulder. Difficulty in vision appeared 36 hours after the initial weakness, and grew steadily worse, necessitating admission to the hospital.

In the past history it was noted that the patient had had a chancre of the penis 15 years before and had received some treatment. He suffered from convulsions until 10 years of age. No history of rheumatic fever or joint pains could be obtained.

Physical examination revealed a well-developed and well-nourished man who was excited, overtalkative and confused, with alternating periods of rational behavior. At times he sang, tried to get out of bed and struggled at the restraints. He realized that he was in a hospital, but did not know in which one. The temperature was 100°F., the pulse 96, and the respirations 28. The pupils were fixed to light and accommodation. A divergent strabismus was present. The eyes were able to follow a finger on downward gaze and to a very slight extent on upward gaze. No motion was present in any other direction. There was ptosis of both upper lids, more marked on the left, with flattening of the left nasolabial fold. The fundi were negative. The heart was enlarged on the left and right. There was a loud aortic systolic murmur which was transmitted upward to the neck, and a diastolic murmur which was heard best to the left of the midline. A double mur-

mur was heard over the mitral area. The blood pressure was 118/74. The speech was nasal in character, and the masseter muscles were weak. There was a generalized weakness of all muscles, but the greatest involvement was present in the lower extremities. The right deep-tendon reflexes were slightly more active than on the left side. There were bilateral Babinskis.

Examination of the urine showed a slight trace of albumin, occasional clumps of white blood cells, and rare hyalin and granular casts. Blood examination showed a hemoglobin of 84 per cent (Sahli), a red-blood-cell count of 4,510,000, and a white-cell count between 6650 and 17,500. A blood Hinton reaction was positive, and a blood culture was negative. An x-ray of the chest showed fluid at the left base. The spinal fluid was under an initial pressure of 180 mm. of water. The fluid was clear and colorless and contained 15 cells per cu. mm. The protein content was 30 mg. per cent, and colloidal gold and Wassermann reactions were negative.

The temperature, which had ranged between 99 and 101°F. on admission, rapidly became septic in type, varying between 100 and 105°F. The pulse was 120 and the respirations 30. No petechiae were seen. Dullness, increased breath sounds and moist rales were present at both bases posteriorly. Another blood culture was negative. The pupillary reactions, at first absent, returned later, otherwise there was little change in the neurologic status. During the last week of illness frequent bouts of profuse sweating accompanied by psychomotor hyperactivity occurred. Between these episodes the patient appeared rational and co-operative. He died suddenly 4 weeks after admission.

The necropsy was performed 15 hours post mortem by Dr. D. R. Wier of the Mallory Institute of Pathology. The heart weighed 500 gm. There was marked thickening and stenosis of the mitral and aortic valves. The chordae tendineae were thickened and shortened. An adherent, firm, mural thrombus extended through the mitral valve, and adhered to the adjoining endocardium of the left ventricle. On the surface of this thrombus was a small amount of formed blood clot. The convolutions of the brain were narrowed and the sulci widened. On cut section, sharply demarcated areas of necrosis were present in the right substantia nigra (0.5 by 0.2 cm.) and in the posterior part of the right quadrangular lobe of the cerebellum (2.7 by 0.8 cm.); the latter was yellow-red and confined to the cortical ribbon. Similar infarcts were present in the anterior part of the vermis and in the pons.

Microscopic examination of the heart showed marked degeneration of the muscle bundles. The valves were thickened by dense hyalin tissue and infiltrated by a few lymphocytes and mononuclear cells. No bacteria were seen in sections stained by the MacCallum-Goodpasture method. Microscopic examination of the brain showed the following. The right substantia nigra disclosed an area in which the normal architecture was completely destroyed and which was diffusely infiltrated by fat-laden macrophages. At the boundary of the lesion were a large number of pigment-bearing macrophages. Similar areas were seen in the left substantia nigra and in the pons. An older lesion made up of many fatty macrophages interlaced by glial cells was present in the pons. The cerebellar sections revealed an area of softening 16 by 9 mm. The cortical ribbon was completely broken down and replaced by fat-laden macrophages. The supporting white matter showed ischemic necrosis. This lesion was bordered by several smaller ones in which glial proliferation could be seen. The medulla oblongata was normal.

This patient presented a diagnostic problem which was not solved even at the time of death. The difficulty in this case arose from the rapidity of evolution, the multiplicity of signs of involvement of the brain stem, the history of a chancre and a positive blood Hinton reaction, and negative blood cultures. Diagnoses of epidemic encephalitis and of syphilitic meningoencephalitis were entertained. Neither could be substantiated. The bizarre nature of the clinical picture did not suggest subacute bacterial endocarditis, but recapitulation brings out many similarities between this and the previous cases. The onset of symptoms coming so abruptly after the extraction of an abscessed tooth was of great significance. Although this case was not proved by the requisite criteria, it has been included because of its startling similarity.

STATISTICAL DATA

The total admissions to the Boston City Hospital between the years 1924 and 1937 numbered 385,397. In this period the diagnosis of subacute bacterial endocarditis was made in 267 cases but on critical analysis it could be thoroughly substantiated by generally accepted criteria in only 100 cases. This diagnosis was considered established beyond any reasonable doubt if a positive blood culture of *Streptococcus viridans* was obtained, or if this organism had been demonstrated in the fresh valvular vegetations on postmortem examination. These are essentially the criteria suggested by Davis and Weiss.[6] They were the basis for the diagnosis in the 100 cases which constitute this series. The average age was 31.8 years, and the ratio of males to females was 57:43.

Thirty-one per cent of the cases were admitted to the hospital with one or more neurologic manifestations. In most of the cases these led to erroneous diagnoses, such as Schilder's disease, anterior poliomyelitis, cardiac psychosis, sciatica, polyneuritis, mycotic cerebral aneurysm with rupture, cerebral hemorrhage, encephalitis lethargica, central-nervous-system syphilis, brain tumor and tuberculoma. In most cases the correct diagnosis was made late in the course of the disease. Seven cases were diagnosed at necropsy examination and clinically were thought not to be instances of subacute bacterial endocarditis.

Definite signs of involvement of the central nervous system were present in 31 per cent of the patients on admission. In 20 per cent the symptoms and signs were so predominantly neurologic that the primary lesion was thought to be in the central nervous system.

The frequency of the various symptoms and signs referable to the central nervous system is shown in Table 1. It will be seen that headache, speech

difficulty, vomiting, drowsiness, coma and dizziness were the most frequent symptoms, occurring in from 15 to 24 per cent of the cases. Confusion, delirium, visual symptoms, restlessness, nervousness, irritability, irrationality, convulsions and emotional disturbances were the next most frequent symptoms, being reported in from 5 to 10 per cent. Two cases of intractable hiccough occurred, and 1 patient complained of loss of hearing. These statistics are in agreement with those of Blumer,[4] previously cited.

Table 1. *Incidence of Neurologic Symptoms and Signs in 100 Proved Cases of Subacute Bacterial Endocarditis.*

SYMPTOMS	PERCENTAGE OF CASES	SIGNS	PERCENTAGE OF CASES
Headache	24	Hemiplegia or hemiparesis	31
Speech difficulty	19	Cranial-nerve palsies	25
Vomiting	18	Reflex changes	22
Dizziness	17	Hemorrhages in ocular fundi	22
Coma	17	Choked disks	8
Drowsiness	15	Positive Kernig	7
Confusion	10	Clonus	5
Visual difficulty	10	Positive Babinski	4
Delirium, Restlessness, Irritability, Irrationality, Convulsions	6	Tremors in extremities	2
Nervousness, Emotional disturbance	5		
Hiccough	2		
Hearing difficulty	1		

Hemiplegia or hemiparesis and cranial-nerve paralysis were the most frequent neurologic signs, occurring in 31 and 25 per cent, respectively. Many of the cases of cranial-nerve paralysis should be excluded because they consisted of facial paralysis accompanying a hemiplegia. In a few instances there was a ptosis or a hypoglossal paralysis. Choked disks were observed in 8 patients, and hemorrhages in the fundi in 22. Sixteen cases presented hemiplegia on admission. The reflex changes varied from an exaggeration of reflexes on one side to absence of deep reflexes. Seven per cent showed a positive Kernig sign. Subarachnoid hemorrhages were found in 2 patients on admission, and an intracerebral hemorrhage was present in 6.

SUMMARY AND CONCLUSIONS

Two certain and 1 unproved case of subacute bacterial endocarditis with neurologic signs, which offered considerable diagnostic difficulty, are reported.

Thirty-one per cent of the 100 patients with subacute bacterial endocarditis admitted to the Boston City Hospital between 1924 and 1936 showed one or more neurologic manifestations on admission. In 20 per cent the symptoms and signs were so predominantly neurologic that the primary lesion was thought to be in the central nervous system.

Subacute bacterial endocarditis should be kept in mind as a diagnostic possibility when a young adult is admitted to the hospital complaining of drowsiness, severe headache, double vision, impairment of speech or sudden loss of consciousness, particularly when he shows cranial-nerve palsies or a hemiplegia. These neurologic manifestations may be the earliest evidence of the existence of subacute bacterial endocarditis. Careful examination of the heart and repeated blood cultures will prevent errors in diagnosis.

The authors acknowledge the aid given by Miss Ruth T. Church in the compilation of the data.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24131

PRESENTATION OF CASE

A forty-seven-year-old Italian fruit dealer entered the hospital with the complaint of chronic cough.

As a young man he had malaria over a period of about six years, and during that time he first began to cough. He coughed daily for the thirty years before entry. At the time of entry he had spells of coughing when he rose in the morning, after his lunch and supper and at night. He raised a total of more than a cupful of thick, yellow nonodorous sputum daily. He thought that the sputum had increased in amount during the five years before entry. He had occasional night sweats but no chest pain, hemoptysis, continued fever or other cardiorespiratory symptoms, except slight dyspnea on mild exertion. He thought that at about the age of five he had empyema in the right chest which was operated on and drained for a month.

Twenty years before entry he had influenza, "double pneumonia" and typhoid fever. He did not remember what childhood diseases he had had. He had had frequent colds and occasional epistaxis after blowing his nose. He had not lost any weight. His past history was otherwise negative, and his family history was not contributory.

Physical examination revealed a well-developed and nourished Italian appearing to be in excellent health. There was an operative scar 1 cm. above the right nipple. His heart was negative, and the blood pressure was 140 systolic, 80 diastolic. The lungs showed no dullness to percussion. At the right base and in the lower part of the right axilla many coarse moist rales could be heard, without change in the breath sounds. However, in the left axilla between the left nipple and the left posterior axillary line similar moist rales could be heard, without other signs. The extreme bases of the lungs were clear. There was moderate clubbing of the fingers.

The temperature was 98°F., the pulse 85. The respirations were 20.

The urine showed the slightest possible trace of albumin. The blood showed a red-cell count of 4,770,000 with 85 per cent hemoglobin, and a white-cell count of 16,700 with 78 per cent polymorphonuclears. The sputum contained numerous pus cells and a few diplococci, but no tubercle bacilli. The nonprotein nitrogen of the blood serum was 20 mg. per cent, and a blood Hinton test was negative. An electrocardiogram showed slight left-axis deviation.

An x-ray of the chest revealed a sharply defined rounded area of density completely occupying the region of the right middle lobe. The left lung and the upper and lower lobes on the right were clear. The heart shadow was a little prominent in the region of the left ventricle. There were no mediastinal masses.

On the fourth day an operation was performed.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: Here is the round mass that was described occupying the entire area of the middle lobe. The shadow looks larger and rounder than the middle lobe would ordinarily appear but it does not cross the interlobar fissures. It is apparently confined to the middle lobe. He has thickened pleura over the right apex and along the upper axillary line. His right diaphragm moved well except at its anterior portion. The diaphragm is relatively low on both sides. In this dense shadow you can see two or three areas of diminished density with horizontal lower borders which suggest small cavities with fluid levels. This is the upper margin of the mass, and if these shadows are cavities, then the wall of the mass is quite thin. Apparently it is a thin-walled fluid-containing mass. There is no evidence of metastatic cancer or enlarged nodes.

DIFFERENTIAL DIAGNOSIS

DR. JOHN W. CASS: The story of a forty-seven-year-old man with a cough of thirty years' duration means that the history may well be incomplete. It may have been difficult for the man to remember the onset of his illness, and incidents such as foreign-body inhalation or acute respiratory infection may have been forgotten. As a youngster over a period of six years he was supposed to have had malaria, and during that period he noticed cough. This was the first illness that he remembered much about. It may not be the true onset of the cough. However, he does remember that for a number of years, apparently thirty, the raising of sputum associated with this cough occurred chiefly in the morning, after meals or often at night, which means there was a cavity or several small cavities, the drainage of which was aided by intra-abdominal pressure changes. The sputum was thick and nonodorous. There is nothing particularly characteristic about that, though it indicates that the usual mouth spirochetes had not complicated the infection. He thought the spu-

tum had increased in amount. That is very indefinite and of no significance that I can see. He had occasional night sweats — an indication of infection — but no chest pain and no hemoptysis. The fact that he had no continued fever means, I presume, that the infection was fairly adequately drained. There were no cardiorespiratory symptoms except dyspnea, so the process was probably not extensive, and did not cut down the vital capacity or add any burden to the circulatory system. He had had empyema at the age of five, which drained for a month. This is important because an empyema can last this long, and if the raising of sputum and cough did not occur until many years after the original empyema, it is possible that a bronchial fistula developed many years after the original empyema.

The influenza and "double pneumonia" twenty years before entry are probably of no significance, since the underlying chronic lung infection may have made him more susceptible to other chest infections. He had had frequent colds but lost no weight, which means that the disease had been handled fairly adequately and that he had not suffered any great impairment of health. From the history there are many diagnoses suggested, namely bronchiectasis, tuberculosis, abscess, empyema with a bronchial fistula, unusual infection, such as is caused by yeasts or fungi, or even possibly a benign tumor.

On physical examination it was again mentioned that the patient was well-developed and nourished. He appeared in excellent health. There was an operative scar on the right side, evidently the area of drainage of the empyema. The blood pressure was 140 systolic, 60 diastolic, with a normal heart, which again means that the disease had not handicapped his circulatory system. The lungs showed no dullness, which is surprising; you would expect dullness from a localized area of disease that was capable of producing a cup of sputum.

"At the right base and in the lower part of the right axilla many coarse moist rales could be heard, without change in the breath sounds." So there is disease by physical examination on the right side, but on the left side there were similar rales. This is confusing. One would like to believe one was dealing with a more local process.

Clubbing of the fingers is usually indicative of congenital heart disease, which is absent in this case, or a suppurative lung condition. By physical examination we can demonstrate a lung condition, and the findings are more compatible with bronchiectasis than with the others mentioned. I attach no significance to the temperature, pulse and respirations. He must have had fever from time to time, but with a chronic lung condition with fairly good drainage it is possible to have little or no fever.

The nonprotein nitrogen was normal. He probably had no real chronic nephritis. He perhaps had amyloid disease, which one does have to think of with a process of this duration. There is no Congo red test to help to make this diagnosis. I do not see how it can be made on the basis of the information at hand. The sputum shows nothing definite. No tubercle bacilli were seen and one would think they could be found easily in a process draining as freely as this. The blood Hinton test was negative; there is nothing to suggest a syphilitic process. The electrocardiogram seems to be compatible with the patient's age. The absence of right-axis deviation means that the process caused no great impairment to the pulmonary circulation.

From the laboratory work we cannot rule out any of the mentioned diagnoses. Lipiodol would be a great help in the diagnosis of bronchiectasis. Tuberculosis I think has been ruled out. I do not believe we are dealing with cancer, and we narrow the diagnosis down a bit. The x-ray gives us the first definite localization of this process, localizing it to the right middle lobe, particularly in the lateral film which is so important in middle-lobe disease, as pointed out by Dr. Hampton. It does not bear out the finding of disease in the left lung by physical examination and gives us a little more confidence in the belief we are dealing with a fairly localized infectious disease — a chronic suppurative lung condition limited to the right middle lobe. Although a bronchoscopy has not been done, I think benign tumor can be ruled out, because we usually find a good deal of collapse in the middle lobe in this condition. There is no evidence on physical examination to suggest tapping the chest, and probably even nothing on x-ray, although to rule out the diagnosis of empyema with bronchial fistula you would have to tap the chest and probably want to review the physical findings that are given here. I think we can say that the process is probably not an empyema with a bronchial fistula, dating back to the original empyema. Such empyemas are very often associated with a bit of tubing that has been left in, or a piece of bone from a rib end. We have several areas of cavitation demonstrated in the x-ray, so I should be inclined to feel we had ruled out bronchiectasis, tumor, and yeast and fungus infections, and that the differential lies chiefly between empyema and lung abscess. On the basis of the x-ray, I will make a diagnosis of multiple lung abscesses with general suppuration of the right middle lobe.

Clinical Discussion

Dr. Richard H. Sweet: I thought before the operation that we probably were dealing with multiple cystic disease of the middle lobe because, first, it seemed to be so closely confined to the one lobe, and secondly, the x-ray appearance was not that of bronchiectasis, and it would be rather unusual to have a bronchiectasis of thirty or forty years' standing without some involvement of other portions of the lung. The interesting thing was that when we exposed the lobe it was not small and contracted as is the usual bronchiectatic lobe but there was a large mass of tissue, and protruding from the surface were round hemispherical masses varying from 2 to 5 cm. in diameter or larger. These seemed to be somewhat fluctuant, like cystic tumors. The lobe was pink and closely adherent to the anterior chest wall, also to the diaphragm anteriorly and to the cardiophrenic angle. It was also intimately adherent to the upper lobe and to a portion of the lower lobe. The large thin-walled cystic tumor which Dr. Hampton described was adherent to the adjacent surface of the upper lobe, and in dissecting the mass free we broke into it. It had a wall no thicker than a sheet of paper. We aspirated many ounces of fluid, which was not thick and purulent, such as one sees in lung abscess, but just turbid and watery, very much like sputum mixed with saliva. We finally took the lobe out; Dr. Mallory will tell us what it looked like.

Preoperative Diagnosis

Bronchiectasis, right middle lobe.

Dr. Cass's Diagnosis

Multiple lung abscesses, right middle lobe.

Anatomical Diagnosis

Bronchiectasis, right middle lobe, ? congenital type.

Pathological Discussion

Dr. Tracy B. Mallory: This is the type of case which immediately brings up questions of definition which are not universally agreed upon. What are the differences between abscesses, bronchiectases and cysts? The distinction between the first two I think we should be able to reach agreement upon in theory, though occasional difficulties may arise in practice. The abscess represents a destructive, necrotizing process in the lung parenchyma. It originates in the alveoli, destroys their walls, results in fusion of many alveoli, spreads peripherally until it erodes the wall of a fair-sized bronchus and then partially drains itself, resulting in a cavity. As the process becomes localized it tends to wall itself off with granulation tissue. Only occasionally does an epithelial lining grow down from the bronchus to line the cavity. In contrast, bronchiectasis represents dilatation of preexisting bronchi. Not only are they lined with epithelium but in their walls other bronchial structures such as remnants of cartilage, smooth muscle and elastic tissue are usually easily demonstrable. The pulmonary parenchyma — the alveolar tissue — may be collapsed and atelectatic or scarred and contracted as the result of organizing pneumonitis, but it has not been destroyed. With suitable staining methods it can still be recognized.

In contrast to these two clearly defined pathogenic entities, "cysts" and "cystic disease" represent a conglomeration of unrelated conditions. There are parasitic cysts such as hydatids, and neoplastic cysts such as cystic lymphangiomas. There are fluid-filled, epithelial-lined cysts without bronchial connection, which almost certainly represent developmental abnormalities. Finally, there are air-containing cavities with bronchial connection which may or may not show an epithelial lining. In the latter instance they are difficult or impossible to distinguish from emphysematous bullae, in the former from bronchiectatic cavities. There is a fetal form of bronchiectasis, — undoubtedly a developmental abnormality, — which may persist into adult life, that has often been described as cystic disease. I presume that is what Dr. Sweet has in mind in regard to this case, and I can neither rule it in or out. The bronchiectatic cavities in this specimen were unusually large, thin-walled and superficial. On the other hand I have seen similar pictures in what I believe was acquired bronchiectasis. His history of respiratory infections runs back to childhood. You can interpret them as the etiologic factor in the development of acquired bronchiectasis or as episodes of infection of congenital bronchiectatic cavities, as you will. My choice, I must admit, is for the commoner acquired type.

Dr. Hampton: If the cavities in the lung had no bronchial connection would you not admit the diagnosis of cystic disease?

Dr. Mallory: Yes; I should not know what else to call it. But in general, in view of the vagueness of the term, it should be used as rarely as possible.

CASE 24132

Presentation of Case

A forty-three-year-old, white, American jeweler entered the hospital with the complaint of difficulty in swallowing.

About eleven months before entry he first noticed that solid foods seemed to stick in his throat. During the next five months this condition gradu-

ally became more severe without pain or other symptoms. At the end of that time the dysphagia increased markedly and was associated with regurgitation. The regurgitated food was occasionally blood streaked. His physician made an x-ray examination and told him that there was some delay in the passage of barium down the esophagus but no definite lesion. He gradually changed to a semisolid diet and for the two months before entry took only liquids. He had no nausea or vomiting or other gastrointestinal symptoms. Three weeks before entry he went to an outside hospital where a barium meal was given and esophagoscopy was done. Following the esophagoscopy he was unable to swallow anything, and this condition persisted up to the time of entry to this hospital. He was kept alive by parenteral fluids. During his illness he had lost about 40 lb. in weight and had become very weak and anorexic. He had no other symptoms, and his past and family histories were noncontributory.

Physical examination revealed an emaciated, dehydrated, cachectic man who was unable to swallow even his saliva. There was marked pallor of the skin and mucous membranes. There was soft, diffuse fullness of the lower anterior part of the neck without definite fluctuation. The physical examination was otherwise negative. The blood pressure was 130 systolic, 84 diastolic.

The temperature was 102°F., the pulse 90. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 5,200,000 with 90 per cent hemoglobin, and a white-cell count of 18,600 with 88 per cent polymorphonuclears. The blood Hinton test was negative. The nonprotein nitrogen of the blood serum was 18 mg. per cent, the chlorides were equivalent to 102 cc. of N/10 sodium chloride, and the protein was 5.3 gm. per cent.

On the day following entry an operation was performed for drainage of a retropharyngeal abscess. An incision was made over the clavicle and dissection carried down to the esophagus, where about 120 cc. of very foul pus was found in the periesophageal area. A stained smear of the pus showed slender gram-positive bacilli, gram-negative bacilli, and gram-positive cocci in clusters and chains. He continued to run a septic temperature and drained moderate amounts of material from his neck wound. On the fifth day he began to expectorate foul pus, which apparently came from his nasopharynx. A stomach tube had been passed, and he was being given adequate amounts of fluid and nourishment. Early in the morning of the eighth day he bled profusely from his mouth. The bleeding was controlled by setting him up in bed, but a few hours later he bled profusely again, this time from the wound in his neck. The blood was apparently of venous origin, as it was dark in color and oozed out slowly. The bleeding from the neck occurred twice that day and was controlled by packing of the sinus and by the application of pressure bandages over the shoulder. He was given three transfusions of 500 cc. each. Late in the afternoon of the same day he coughed up a little blood and five minutes later suddenly became very dyspneic; he rapidly lost consciousness and died within a few minutes. Just before this final episode his pulse and blood pressure were observed to be normal.

Differential Diagnosis

Dr. Edward B. Benedict: We have to consider all the possibilities of esophageal obstruction in this patient, although most of them seem very unlikely. We must first determine whether this is an extrinsic lesion or an intrinsic one. Among the extrinsic lesions is neoplasm of the mediastinum, either primary or secondary. If the lesion were mediastinal, causing these esophageal symptoms, we should have other symptoms such as pressure on the recurrent laryngeal nerve, pressure on the sympathetics, causing Horner's syndrome, or pressure on the trachea with deviation and possibly dyspnea. Goiter might produce pressure on the esophagus, and there is swelling of the neck; but that was later proved to be inflammatory, and furthermore, I do not believe that goiter alone could give complete esophageal obstruction. Aneurysm is partially ruled out by the negative Hinton test, and also I cannot conceive of its giving complete obstruction of the esophagus.

Then we come to intrinsic esophageal disease, and the first thing we think of is foreign body. There is no history of such. There is no history of caustic burn. Paralysis of the esophagus is rare and would not give complete obstruction. Diverticulum of the esophagus is unlikely from the history, and would not give complete obstruction. Syphilis of the esophagus is very rare, and the Hinton test is negative. Tuberculosis is very rare. Actinomycosis is extremely rare. Ulcer of the esophagus occurs chiefly at the lower end, whereas this lesion apparently was in the upper portion. Ulcer is also rare and usually gives substernal pain, of which we have no history. Cardiospasm is a fairly common disease of the esophagus. It occurs entirely at the lower end and gives a long history of intermittent symptoms, which we do not have in this case. If it were a benign stenosis from a previous esophagitis or trauma, we ought to have some history of heartburn or trauma: such is not the case. Also, we have a very ill patient

with complete obstruction, which is unlikely in benign stenosis; furthermore, we have blood-streaked regurgitation, which would be somewhat unlikely.

So we come to neoplasm of the esophagus. Benign tumors of the esophagus are very rare, although Jackson has reported myomas, fibromas, myxomas, adenomas, angiomas and so forth; but I do not believe they give a picture of this sort. Of the malignant tumors we have sarcoma, which is also very rare. Jackson reported only 7 cases of sarcoma out of 935 malignant tumors of the esophagus. On the law of chance we should be right on a diagnosis of carcinoma because, according to MacMillan at the Massachusetts Eye and Ear Infirmary, that accounts for 40 per cent of all diseases of the esophagus. As one goes over the record it seems as if it were a perfect story for carcinoma of the esophagus — an eleven months' story of difficulty in swallowing, food sticking in his throat, absence of pain, blood-streaked regurgitation, finally restricting himself to liquids, a weight loss of 40 lb., and coming in emaciated, dehydrated and cachectic. It is so typical that it seems too good to be true, but I will make a diagnosis of carcinoma of the esophagus.

Then we have to explain the septic process, the temperature of 102°F., and the white-cell count of 18,000. The serum protein I think was a little low and could go with the starvation. The septic process was undoubtedly due to perforation of the esophagus. Whether it was due to esophagoscopic instrumentation three weeks previously is impossible to say; but it looks suspicious. He was unable to swallow anything immediately afterward. It looks as if they had started up some inflammatory reaction, and possibly a slow perforation developed from that or possibly perforation developed spontaneously. We also have to explain why they could pass a stomach tube if he could not swallow his saliva. I think that is explained by the drainage of the periesophageal process and partial clearing up of the lumen of the esophagus. The final episode of bleeding from the neck seems explainable on the basis of cancer with sepsis infiltrating the periesophageal vessels. I should expect the terminal event to have been a massive hemorrhage, explained on the basis of erosion of a large blood vessel.

I have not asked for any report on the x-rays or esophagoscopies because I suppose they are not available.

Dr. Tracy B. Mallory: No; they were done at another hospital. Perhaps Dr. Sowles can give us some more information.

Dr. Horace K. Sowles: I saw this patient on the ward but do not remember the case well. Dr. Welch drained the abscess. I shall read his note.

A transverse incision was made about 2.5 cm. above the clavicle with its midpoint overlying the anterior border of the sternomastoid. Dissection was carried down between the sternomastoid and the thyroid gland. The omohyoid muscle was cut. The middle thyroid vein lay above the blunt dissection. The carotid was retracted laterally. A dense layer of fascia was then broken through, and about 120 cc. of very foul pus evacuated from the periesophageal area. A finger could then be introduced into the abscess cavity. It extended behind the esophagus a short distance on either side of the neck, and it extended for a short distance beyond each clavicle, but the abscess cavity was well delimited in the upper mediastinum. Two drains were inserted.

Clinical Diagnoses

Carcinoma of the esophagus.
Retropharyngeal abscess.
Secondary hemorrhage.
Asphyxiation.

Dr. Benedict's Diagnoses

Carcinoma of the esophagus.
Perforation of the esophagus.
Periesophageal abscess.
Secondary hemorrhage.

Anatomical Diagnoses

Carcinoma of stomach, scirrhous, colloid.
Perforation of the esophagus.
Periesophageal abscess.
Pulmonary embolism.

Pathological Discussion

Dr. Mallory: The autopsy findings verified each of Dr. Benedict's diagnoses up to a certain point, but he did not localize the lesions in quite the right spots. It is true the man had cancer, but he did not have cancer of the esophagus. He had cancer of the stomach. It was a large linitis plastica which had extended up and completely occluded the cardiac orifice. It involved a short portion of the esophagus, but there could be no question from the type of the tumor, with its scirrhous growth and its signet-ring cells, that it was primary in the stomach. The esophagus was perforated, but it was perforated through an area that was in all probability previously normal, far above the carcinoma. A large abscess developed about the perforation, and the final hemorrhage came from an erosion of one of the periesophageal veins. The abscess had not extended to any of the major vessels of the neck. The final episode was a massive pulmonary embolus.

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PUBLIC-HEALTH ADMINISTRATION IN MASSACHUSETTS

PREVIOUS to 1858 very little attention had been given to the causes and prevention of disease except as physicians had, in connection with practice, given such advice or information as seemed appropriate for patients under treatment. But after the ringing indictment of the people by Lemuel Shattuck in that year, in which he urged sanitary reform because of the "thousands of lives lost which might have been saved, and the tens of thousands of cases of sickness that occur every year which might have been prevented," there was an awakening of interest in preventive medicine. Other public-spirited men united with Shattuck in a campaign to bring about reforms in dealing with disease, with the result that the Massachusetts legislature enacted a law in 1869 creating the first state board of health in this country. Then began the organized battle for better health in this State which has been carried on with increasing success through the succeeding years.

In 1879 the title and functions of the board were changed to include charity and lunacy, and the added burden of these other departments of state administration imposed complicating responsibilities which were not wholly in harmony with purely health matters. As a result, in 1886 the care of the indigent and the care of the insane were transferred to their appropriate administration departments, and the original title of Board of Health was resumed and continued until 1914. In that year certain members of the legislature were informed that plans were being formulated to reorganize the board along lines not wholly devoid of political implications.

This movement was regarded as inimical to approved public-health policies, and a defensive counter maneuver, in the form of a bill designed to preserve these policies and traditions and to keep them free from political influence, was proposed. For this purpose, conferences were arranged by Dr. Enos H. Bigelow, then a member of the legislature, with certain physicians, with the result that a voluntary committee was formed to study the situation and formulate a suitable bill. Fortunately the Hon. David I. Walsh was at the time governor of Massachusetts; he cordially co-operated with the committee and supervised the drafting of the bill. One significant episode in connection with the campaign was the appearance before the Council of the Massachusetts Medical Society of the Governor who proclaimed his approval of the bill and assured the medical profession that he would not "play politics with the public health of Massachusetts." This position of the Governor augmented by the work of Dr. Bigelow in the House of Representatives brought about, in 1914, the passage of the bill creating the Department of Public Health, thus inaugurating a new era in the administration of public health in Massachusetts. This department has never been subjected to political interference.

Throughout these sixty-eight years of public-health administration, eminent physicians have guided the health policies of this Commonwealth. During the years of the Board of Health the executive duties were discharged by two chairmen, Dr. Henry I. Bowditch from 1869 to 1886 and Dr. Henry P. Walcott from 1886 to 1914, assisted by executive secretaries in the personnel of Dr. Henry P. Derby, 1869 to 1874, Dr. Charles F. Folsom, 1874 to 1880, Dr. Samuel Abbott, 1880 to 1904, Dr. Charles Harrington, 1904 to 1908, and Dr. Mark W. Richardson, 1908 to 1914.

With the change to the Department of Public Health, the first step was the selection of a commissioner. On invitation the United States Public Health Service sent two of its officers for consideration, and after conference with Governor Walsh, Dr. Allan J. McLaughlin was appointed to this office. He proved to be an able administrator and served until recalled to federal service in 1918.

Dr. Eugene R. Kelly, deputy under Dr. McLaughlin, was then appointed commissioner. His natural qualities and previous experiences enabled him to carry on the duties of the position with success until his death in 1925, when Dr. George H. Bigelow, deputy under his predecessor, was given charge of the department. Endowed with a brilliant mind and unusual physical vigor Dr. Bigelow completed programs under way, initiated important changes in administrative detail, and accepted new duties imposed by the legislature, which were carried on with credit. He embraced every opportunity for incursion to new fields of work with enthusiasm and always seemed to adapt himself to meet unaccustomed associations and problems. His powers of adjustment enabled him to succeed in administrative experiments, as for example, the conduct of the state cancer program at Pondville. His term of office extended through eight years. He resigned to accept the directorship of the Massachusetts General Hospital, but he never lost interest in public-health work and used his influence to secure his successor in the person of Dr. Henry D. Chadwick.

By a fortunate coincidence Governor Joseph P. Ely, then in office, knew Dr. Chadwick personally and was familiar with his great contributions to public health in this State and elsewhere. He approved of Dr. Bigelow's recommendation, and Dr. Chadwick was induced to come back to Massachusetts in 1933 as commissioner.

Dr. Chadwick did not seek the position; the office sought the man. The accomplishments of his four years as commissioner have justified the appointment.

Doctor Chadwick received his medical degree from the Harvard Medical School in 1895 and served a surgical internship at the Boston City Hospital. He practiced medicine in Waltham until 1907 when he was appointed superintendent of the Vermont Sanatorium at Pittsford. In 1909 Dr. Chadwick was invited to direct the construction of a new state sanatorium in Westfield, and was subsequently made superintendent. During the next twenty years, he developed one of the first sanatoriums for tuberculous children in the country, and impressed with the high fatality of pulmonary tuberculosis in children, secured legislative support for a ten-year program for the discovery and control of tuberculosis in children — the first organized state effort in this field, and the most comprehensive plan ever completed.

In 1929 Dr. Chadwick accepted a position in the Detroit City Health Department. He had full charge of the tuberculosis program, and for the first time developed adequate diagnostic and sanatorium facilities for Negroes affected with the disease. To meet the needs for additional hospital facilities he arranged for the subsidizing of beds in private hospitals and the training of medical and nursing personnel to make these beds effective. While in Detroit he was also engaged in the survey of the tuberculosis problems in the cities of Washington and Denver, and advised the official organizations of those cities in the development of their diagnostic and sanatorium programs.

Among his outstanding achievements as commissioner in Massachusetts is an extensive study of the state public-health laws by representatives of various official and voluntary public-health organizations, with the financial assistance of the Commonwealth Fund of New York City. This

study resulted in a comprehensive set of recommendations, many of which have been enacted into law. As a result of one of these the Department of Public Health was authorized in 1937 to contract with one or more metropolitan hospitals for the care and study of a group of not more than twenty-five patients with chronic rheumatism in order to determine the possibilities for relief of the victims of that disease. Another recommendation resulted in the taking over and operation of all municipal syphilis and gonorrhea clinics by the department. As a result of a third recommendation the department has been authorized to set up and maintain special facilities for the transportation of premature infants to certain hospitals for adequate care.

Under a legislative appropriation of 1934 the work of the Pondville Hospital was supplemented by the construction of a ward for twenty-five additional beds and a service and medical building which provides all modern operative facilities for treatment of cancer patients. In 1937 a new unit was added to the Westfield State Sanatorium. This provides fifty beds with complete surgical and radiologic facilities for the treatment of cancer in the western part of the State, and one hundred and forty-four beds for adult tuberculosis.

In 1936 the pneumonia serum program, started with the aid of the Commonwealth Fund, was taken over by the department. This program involved the establishment of some eighty typing and serum-distribution stations in general hospitals throughout the State, in addition to the manufacture of pneumonia serum at the Antitoxin and Vaccine Laboratory at Forest Hills.

With the assistance received under the Social Security Act the department's program in child and maternal hygiene has been greatly expanded, and approximately twelve per cent of the supplementary funds have been used for postgraduate medical education of Massachusetts physicians.

Federal activities under the CWA, WPA, PWA and CCC have greatly increased the department's work and responsibilities in the field of sanitary engineering. This has included a very effective mosquito control and drainage program on Cape Cod, and the study and approval of plans for a large number of municipal sewage-disposal systems receiving federal aid. Under the guidance of the engineering staff much has been done to reduce pollution of many rivers and streams of the State. At Dr. Chadwick's suggestion the sanitary engineering work at all state institutions has been taken over by the department with a substantial saving in expense. Requests from cities and towns for advice and assistance in sanitary problems have doubled in the past four years, and in 1937 a sanitary engineering laboratory was opened in Westfield which provides the same type of service in western Massachusetts which has been previously available in the eastern part of the State.

An example of Dr. Chadwick's constructive cooperation with the medical profession is his development of the Services for Crippled Children. Legal responsibility for this work was transferred from the Department of Public Welfare to the Department of Public Health in 1936. With the advice and assistance of the state and district medical societies ten clinics have been established in different areas, at which children are examined only on application of a physician, and hospitalization is recommended only with approval of the local medical society. Physiotherapy, public-health nursing and social service are provided through the clinics, acute cases are hospitalized in the local general hospitals, and chronic cases are admitted to the Lakeville State Sanatorium.

In addition to maintaining the efficiency of his department Dr. Chadwick has won the respect of the medical profession and local health officials throughout the State. The approval of the Massachusetts Medical Society and the Massachusetts Public Health Association is shown by appropriate resolutions adopted by these bodies at meetings held this year. It is the hope of our people, we believe, that Dr. Chadwick be continued in office so that the Commonwealth will still have a public-health service of the highest rank. Such service has been available for over sixty-eight years and should not be interrupted.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. Fletcher Eades, M.D., *Secretary*
19 Bay State Road
Boston

Case History No. 65. Partial Separation of the Placenta

Mrs. W., a twenty-nine-year-old primipara, thirty-two weeks pregnant, telephoned at 8:35 a. m., December 12, that she was having intermittent and rather severe abdominal pain. A few minutes later her husband telephoned to say that she was bleeding from the vagina and had passed what he estimated to be over a pint of blood.

The family history was unimportant. The patient had had scarlet fever at fifteen but no other illnesses. Catamenia began at seventeen, were regular, every twenty-eight days, and lasted five days without any unusual pain. Her last period was May 4, making the estimated date of confinement February 11.

The patient first consulted her physician on July 8. She was a well-developed and nourished woman. Her heart was not enlarged; there were no murmurs. Her lungs were resonant throughout, and there were no rales. Abdominal examination showed the uterus to be enlarged to a size compatible with the period of amenorrhea. Subsequent visits revealed no complications. The blood pressure averaged about 110 systolic, 70 diastolic, and the urine never showed any evidence of albumin. On July 29 the patient reported a slight brownish discharge after coitus, and on October 10 after an automobile ride, there was a small amount of bleeding.

When seen at home on December 12, the sheet was found to be covered with an area of bright blood about two feet square. An area about two by three feet on the patient's nightgown was also soaked with blood. She had passed clots. There was no other evidence of severe bleeding, but she was "trickling." The uterus was ligneous, and no fetal heart could be heard.

The hospital was immediately notified to set up the operating room for cesarean section, and the patient was transported to the hospital. On arrival she was shaved and catheterized but given no further medication. She and her husband were grouped and cross-grouped with a view to transfusion, but the husband was found to be incompatible. A suitable professional donor was located. The patient's temperature was 98.4°F., the pulse 64, regular and of good quality and fair tension. Her blood pressure was 92 systolic, 60 diastolic. An assistant and anesthetist had been summoned and were present on arrival of the patient. A 5 per cent solution of glucose was ready for intravenous medication when needed. An immediate transfusion was not deemed necessary as the patient's general condition was good. No vaginal examination was done. Rectal examination showed a typical primiparous cervix which was not taken up or dilated. In view of the fact that she was a primipara and not in labor, abdominal delivery seemed wisest and safest.

Under nitrous oxide and oxygen and ether anesthesia a low classical cesarean section was done. The membranes were ruptured, followed by a gush of dark blood. A dead male baby, weighing 3 lb., 4 oz., was extracted through the uterine wound. An ampule of posterior-pituitary extract was given intravenously at the time of incision of the uterus, and after delivery of the baby. Examination of the uterus disclosed that the placenta, which was normally seated, was about half separated. The placenta and membranes were delivered complete and intact by suprafundal pressure. This was followed by a considerable amount of blood clot. There was no further bleeding. One ampule of Ergometrine was then given intramuscularly. During the operation 1500 cc. of 5 per cent glucose was given intravenously. The patient's pulse at the conclusion of the procedure was 80, and although her blood pressure was 64 systolic, 40 diastolic, there was no evidence of shock.

During her postoperative convalescence she ran a temperature of from 100 to 101°F. for several days, otherwise it was normal.

Blood examination on December 13 showed counts of 2,250,000 red blood cells and 15,000 white blood cells, and a hemoglobin of 52 per cent. A stained smear showed a polymorphonuclear leukocytosis. On December 21 the count was 3,200,000 red blood cells, with a hemoglobin of 65 per cent.

Comment. Time was wasted in visiting this patient at home; she should have been transported immediately to the hospital.

Abdominal cesarean section on a separated placenta when the baby is known to be dead is not the most conservative method. Had this cervix been dilated sufficiently to allow the rupture of the membranes, and if cervix and vagina had been packed tightly with gauze and a Spanish windlass applied to the fundus, it is probable that the outcome would have been just as successful without the attendant risk of a laparotomy.

This is another case of complete separation of the

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

placenta with a dead baby that showed no evidence of a toxemia. With a blood pressure of only 64 systolic, transfusion at the close of the operation should have been seriously considered.

TREASURER'S REPORT COVERING REFUND DISTRIBUTION

THE Treasurer of the Massachusetts Medical Society makes the following report regarding the refund to district societies for 1938.

The Council voted to distribute the sum of $4000 to district societies. The total number of payments of annual dues received by the Treasurer by March 2, to be counted for the refund, was 3784. Therefore the refund to the district societies for each paid fellow is $1.0570.

The following table gives the number of payments in, and the refund to, each district as of March 25:

District	Number Reported Paid	Refund
Barnstable	36	$38.08
Berkshire	100	105.72
Bristol North	55	58.17
Bristol South	165	174.42
Essex North	152	160.67
Essex South	198	209.28
Franklin	40	42.31
Hampden	254	268.49
Hampshire	47	49.71
Middlesex East	104	109.95
Middlesex North	99	104.66
Middlesex South	759	802.27
Norfolk	633	669.09
Norfolk South	100	105.72
Plymouth	106	112.06
Suffolk	518	547.53
Worcester	335	354.12
Worcester North	83	87.75
	3784	$4000.00

In 1937, for comparison, the total number of payments for the refund was 3734.

CHARLES S. BUTLER, M.D., *Treasurer.*

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning April 4:

BARNSTABLE

Sunday, April 10, at 4:00 p. m., at the Cape Cod Hospital, Hyannis. Subject: Differential Diagnosis and Treatment of Scarlet Fever. Instructor: Charles F. McKhann, Jr. John I. B. Vail, *Chairman.*

BERKSHIRE

Thursday, April 7, at 4:30 p. m., at the House of Mercy Hospital, Pittsfield. Subject: Gonorrhea in the Male. Instructor: Oscar F. Cox, Jr. Melvin H. Walker, Jr., *Chairman.*

BRISTOL SOUTH (Fall River Section)

Monday, April 4, at 4:30 p. m., at the Union Hospital, Fall River. Subject: The Use of Vitamins in Pediatric Practice. Instructor: Louis K. Diamond. Howard P. Sawyer and Robert H. Goodwin, *Chairmen.*

ESSEX NORTH

Friday, April 8, at 4:30 p. m., at the Lawrence General Hospital, Lawrence. Subject: The Use of Vitamins in Pediatric Practice. Instructor: Harold L. Higgins. John Parr, *Chairman.*

FRANKLIN

Wednesday, April 6, at 8:00 p. m., at the Franklin County Hospital, Greenfield. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Marshall N. Fulton. Halbert G. Stetson, *Chairman.*

HAMPDEN

Thursday, April 7, at 4:00 p. m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 p. m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject: Early Syphilis. Instructor: William P. Boardman. George D. Henderson and George L. Schadt, *Chairmen.*

HAMPSHIRE

Wednesday, April 6, at 4:15 p. m., in the Nurses' Home, Cooley Dickinson Hospital, Northampton. Subject: Rheumatic Infection; Rheumatic Heart Disease. Instructor: Benedict F. Massell. Warren P. Cordes, *Chairman.*

MIDDLESEX SOUTH

Wednesday, April 6, at 4:00 p. m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject: Cesarean Section: Analgesia. Instructor: Roy J. Heffernan. Edmund H. Robbins, *Chairman.*

NORFOLK

Friday, April 8, at 8:30 p. m., at the Norwood Hospital, Norwood. Subject: Puerperal Sepsis. Instructor: A. Gordon Gauld. Hugo B. C. Riemer, *Chairman.*

NEW FELLOWS APPROVED BY THE COUNCIL

In the minutes of the meeting of the Council, held on February 2, 1938, it is stated, under the heading of Incidental Business, that the secretary presented a list of applicants for fellowship which had been received too late for publication prior to the meeting of the boards of censors on November 4, 1937. These individuals were admitted to the examination and were tentatively passed. The Council voted to approve the action taken and to declare these physicians fellows of the Massachusetts Medical Society.

Inadvertently the list of names was omitted. However,

the list had been published in the *Journal* for January 6, 1938, and is as follows:

ESSEX NORTH DISTRICT

Kay, Julius — Lawrence General Hospital, Lawrence.
Tufts College Medical School, 1937.

ESSEX SOUTH DISTRICT

Freedberg, Alan Phillips — 360 Essex Street, Salem.
Rush Medical College, University of Chicago, 1935.

Hobbs, Wayne — 1 Prescott Road, Lynn.
Harvard Medical School, 1935.

SUFFOLK DISTRICT

Higgins, Francis Henry — Boston City Hospital, Boston.
Harvard Medical School, 1934.

Hurwitz, Alfred — Beth Israel Hospital, Boston.
Johns Hopkins University School of Medicine, 1933.

O'Brien, Francis Robert — Boston City Hospital, Boston.
Tufts College Medical School, 1935.

ACTIVITIES OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH IN 1937

It is my privilege to give you a brief summary of the work carried on by the Massachusetts Department of Public Health during the past year. The problem of a healthy population is of individual importance to every resident of Massachusetts.

Many significant events took place in the department during 1937. Doubtless the farthest-reaching in its effect on the public health of the State was the report submitted to the legislature in December, 1936, by the Special Commission appointed in 1935 to study and investigate public-health laws and policies. All phases of public-health activities were studied, and many changes in legislation recommended. Altogether, fifty-eight bills were presented for consideration. It is with much gratification that I can report that fourteen of the fifty-eight recommendations were enacted into law. Others were referred to the next annual session to be taken up again or reintroduced in an amended form.

Three of the laws place upon the department important new responsibilities. Chapter 332 provides for the care of certain premature infants. Under this law boards of health are required, upon request of the physician or parent of the premature infant, to provide transportation to a hospital equipped to care for such infants, and if the parents are unable to pay for such hospital care, it becomes the responsibility of the board of public welfare. The Division of Child Hygiene of the department has cooperated with maternity hospitals throughout the State to see that they have proper equipment and trained nursing personnel to care for premature infants.

Chapter 393 is an act for the hospitalization of patients with chronic rheumatism. The term "chronic rheumatism" comprises a group of diseases the most evident symptoms of which usually appear in the joints. This group of diseases is of grave social and economic import. It is estimated that over 5000 persons in the State are totally disabled and about 140,000 crippled to some degree. The incidence among the poor is about 50 per cent higher than among the well-to-do.

Chapter 391 transfers to the Commonwealth the responsibility for the treatment of persons having genito-infectious diseases, who are unable to pay for private medical care. The vast amount of work on a state-wide basis which this legislation entailed made a new division necessary. The Subdivision of Venereal Diseases, formerly part of the Division of Communicable Diseases, was changed to the Division of Genitoinfectious Diseases.

An interesting feature of the work of the department is that being done for cripped children. Federal grants from the United States Public Health Service and Children's Bureau made possible the establishment of ten clinics throughout the State. Seven hundred crippled children have been admitted to these clinics. During the year 1423 clinic visits were made and over 2000 physiotherapy treatments given either in the patients' homes or in a central gathering place. One hundred and eighty-four children were admitted to hospitals for surgery or to be fitted with apparatus to correct deformities. These clinics take care of underprivileged children who would not otherwise receive proper treatment.

Five more communities passed regulations requiring the pasteurization or certification of all milk sold locally. This brings to thirty-seven the number of communities that have protected their citizens from milk-borne diseases.

The Division of Communicable Diseases reports that the past year was characterized by the lowest case rate and the lowest death rate for diphtheria in the history of Massachusetts. On the other hand, paratyphoid fever and whooping cough were more prevalent than in any previous year. A total of 97,185 cases of communicable diseases was reported during the year, compared with 106,110 for 1936. Most of the difference was due to a lower incidence of measles and mumps.

Lobar pneumonia continued to show high incidence. For the second year the pneumonia program was carried on entirely at state expense. An increasing number of physicians are making use of the serums supplied free by the State to combat deaths from pneumonia. The Massachusetts pneumonia program is attracting attention all over the country, and is an important addition to the health work carried on by the department.

Not a single case of rabies in human beings was reported during the year. Rabies in animals increased, with most reported cases coming from Essex, Middlesex, Norfolk and Worcester counties. Forty-four communities conducted dog immunization clinics to aid in controlling this disease.

For the sixth consecutive year no smallpox was reported in the State. The value of compulsory vaccination for school children cannot be too strongly stressed as the means of wiping out this terrible disease which used to ravage the State every few years.

The Division of Tuberculosis reports that the number of children treated for tuberculosis had dropped so low that it was possible to close three children's wards at the Westfield State Sanatorium. This is the most outstanding evidence of the value of the tuberculosis control program that has been carried on in the State for the past forty years.

A new cancer-tuberculosis unit, providing 50 beds for the treatment of cancer and 144 for tuberculosis, was added to the Westfield State Sanatorium. This new unit, which maintains outpatient service for both diseases, will be of inestimable value to the western part of the State. The beds for cancer are already occupied, and but few vacant ones remain for tuberculosis.

The three state laboratories report an increase in their activities. Work at the Antitoxin and Vaccine Laboratory has been materially affected by the increasing impor-

A "Green Lights to Health" broadcast given by Dr. Henry D. Chadwick on Wednesday, March 23, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

tance of pneumonia and decreasing incidence of diphtheria. During the January floods, at the request of the United States Public Health Service, we sent 87,000 cc. of vaccine to the flooded areas of Kentucky and Ohio. The Wassermann Laboratory reports a new high level for the number of examinations done. Nearly 200,000 blood examinations were made, an increase of about 50,000 specimens. The Bacteriological Laboratory had an exceptionally busy year, due to three paratyphoid outbreaks, several outbreaks of dysentery, and a great increase in the number of specimens of sputum submitted from pneumonia patients. The laboratory continues to act as a training center for laboratory technicians who come for instruction in pneumococcus typing from laboratories approved by the State for pneumonia-serum distribution.

The Division of Child Hygiene reports many successful projects carried out during the year. In addition to the premature-infant program previously referred to, many other educational programs were continued. Postgraduate courses for physicians throughout the State were carried on in five centers, and a "refresher" course for physicians interested in well-child conferences was held in conjunction with the Harvard School of Public Health, Boston Lying-in Hospital, and other institutions. Audiometer testing to determine the hearing sensitivity of school children was carried on successfully in many towns. The work of this division is widespread and covers every field of child-health care.

The Division of Adult Hygiene continued its research work with cancer, diabetes and arthritis. Two new clinics were opened bringing the number of state-aided cancer clinics to twenty-one.

In addition to its usual work, the Division of Sanitary Engineering participated in eight special investigations concerning water supplies and sewage-disposal problems. Reports on these studies have been submitted to the legislature. Their investigation of trailer camps indicated that facilities for water supply and sewage disposal at such camps have shown decided improvement, as compared with conditions found two years ago.

In the Division of Food and Drugs, 18,835 samples were examined in 1937, an increase of about 1500 over the previous year. Violations of the mattress law were reduced more than 50 per cent, and ice-cream and soft-drink plants in general showed much improvement over the preceding year.

In this brief time it is impossible to go farther into the work of the department, but this may give you a general idea of the extremely varied fields of health work carried on by the State. The past year was a healthy one for Massachusetts, and one productive of increased opportunities for broadening the field of the department's activities.

Q. When you speak of the remarkable drop in tuberculosis, does it mean that tuberculosis is now nearly wiped out?

A. By no means. Because the number of people dying from tuberculosis is declining each year and the death rate is but 43 per 100,000 as compared with 243 at the beginning of the century, many people believe that it is no longer a menace. Unfortunately this is not so. It is still the leading cause of death in the age group from twenty to forty. Great strides have been made in reducing the incidence of this widespread disease, but there is still much to be done. Only constant vigilance on the part of doctors and health authorities, and ready co-operation on the part of parents of suspicious cases, or patients who have already contracted the disease, will bring tuberculosis down to the minimum toward which the State is striving. It is a major health problem, and there must be no slackening in the efforts made to control it.

Q. You spoke of the pneumonia program becoming an integral part of the state health work. What particular work was accomplished in this field during recent years that would warrant its being taken over by the State?

A. Following a five-year study carried on by the department with the aid of the Commonwealth Fund it was determined that serums prepared for certain of the thirty-two types of pneumonia were curative when administered early in the disease. To make this available to physicians it was necessary to train laboratory technicians to examine the sputum of patients suspected of having pneumonia. This was done and there are now eighty approved hospital laboratories in the State where physicians can have the typing done. Serums for five types of pneumonia are furnished by the department without charge to the patient. Several hundred pneumonia deaths annually can be saved by the use of these serums for the cases in which they are indicated.

Q. In your talk about the work done with crippled children you said that the work was only for children who could not otherwise receive medical care. How do you find these children?

A. The children are referred by doctors to one of our clinics which are held monthly in ten cities. They vouch for the children's need of care, and for the inability of the families to pay for proper attention. In this way we are able to give aid where it is most needed to persons under twenty-one years of age. No one is accepted without a physician's recommendation.

Q. The Division of Food and Drugs must have many interesting features. What do you consider the most outstanding event in that department during the year?

A. There is little doubt that the most important event in the Division of Food and Drugs was the adoption of the phosphatase test for distinguishing between properly and improperly pasteurized milk. This chemical test can be done on milk taken from any milk wagon and does away with the former necessity of the inspector's being at the pasteurization plant at just the right moment during the pasteurization process, to see whether it was being properly conducted. By this test it can be determined accurately whether milk has been kept at the proper temperature for sufficient time to kill bacteria. Routine examinations with the phosphatase test have been given for the past five months, and the number of alleged pasteurized samples that proved upon testing to be improperly processed have decreased rapidly.

Q. Can premature infants be taken care of at any hospital, or is special equipment necessary?

A. About 1000 premature infants die within the first month of life. In certain hospitals with special equipment and nurses trained for this work the death rate for these infants is only half that in the State as a whole. Special equipment and care are necessary for premature infants, and the department is working on a network of hospital centers that will be available to every part of the State. There are now thirty-four of these hospital centers established, and there will be nearly fifty when this part of the program is completed.

Q. What, exactly, is meant by a "premature infant"?

A. The law defines a premature infant as one weighing five pounds or less. They need special care. There are many infants weighing more than five pounds who are feeble and in need of special care. We hope that eventually this program will help improve the standard

of care of all such infants and their mothers, and thus save the lives of 400 or 500 babies each year.

Q. Is it true that the trickling filter for sewage treatment at the department's Experiment Station in Lawrence was the forerunner of the present trickling filter now in use in many cities and that the Massachusetts Department of Public Health was a pioneer in such matters?

A. Yes; the Experiment Station of the department was the first of its kind established on this continent and probably the first of its kind in the world. In this station were developed most of the basic data on which modern methods of treatment of water and sewage have been founded, and it was also at this station that our present methods for the bacterial examination of water were advanced. As a result of the experiments done at this station, Massachusetts has established procedures for the protection of its water supplies, so that at present about 98 per cent of the population live in communities that have safe water supplies. We are singularly free from waterborne diseases, one of which is typhoid fever. A generation ago this disease sickened 2000 or 3000 Massachusetts residents each year. Now it is a rare disease, and this State has the lowest typhoid fever death rate in the country.

DEATHS

COLEMAN — Robert M. Coleman, M.D., of 42 Church Street, Wellesley, died March 24. He was in his forty-fifth year.

Born in Wellesley, he attended the Wellesley schools and Phillips Exeter Academy and received his degree from Tufts College Medical School in 1921. During the World War he was in the naval reserve. Dr. Coleman was a former night superintendent at the Boston City Hospital. He was a former fellow of the Massachusetts Medical Society.

His widow, his mother and a brother survive him.

LUNDWALL — Laurence S. B. Lundwall, M.D., of 81 Main Street, Gardner, died February 11. He was in his sixty-second year.

Dr. Lundwall received his degree from the University of Illinois College of Medicine in 1905. He was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

MONCRIEFF — William A. Moncrieff, M.D., of 17 South 6th Street, New Bedford, died December 18, 1937. He was in his forty-eighth year.

Dr. Moncrieff received his degree from Tufts College Medical School in 1913. He was a fellow of the Massachusetts Medical Society, a member of the American Medical Association and a member of the New England Otological and Laryngological Society.

WHITE — Benjamin White, Ph.D., died suddenly in Southern Pines, North Carolina, on March 28. He was in his sixtieth year.

Born in Cooperstown, New York, on January 15, 1879, he received Ph.B. and Ph.D. degrees from Yale University in 1900 and 1903. Following postgraduate study in Berlin, Munich, Vienna and London, he was made assistant director of the Department of Bacteriology, Hoagland Laboratory, Brooklyn, New York, in 1903, and was director of this department from 1907 until 1914, except for a two-year period which was spent at Saranac, New York, on account of his health. While at Saranac he was an assistant in the Saranac Lake Laboratory. In 1914 he returned to New York as an assistant director of the Bacteriological Laboratories of the New York City Department of Health and in 1920 was appointed director, Division of Biological Laboratories, Massachusetts Department of Public Health. This position he held until his retirement in 1933, his chief duty being the supervision of the Antitoxin and Vaccine Laboratory at Forest Hills. For the past few years he had lived in New York City, and in addition to serving as a consultant to the Commonwealth Fund, recently completed a book *The Biology of Pneumococcus*, which was published by the Commonwealth Fund as a part of their program covering the serum treatment of pneumonia.

At the time of his retirement he was assistant professor of bacteriology and hygiene, Department of Bacteriology, and assistant professor of preventive medicine and hygiene, Department of Preventive Medicine and Hygiene, Harvard Medical School, and lecturer in immunology and instructor in the biological assaying of drugs at the Massachusetts College of Pharmacy. He was an honorary fellow of the Massachusetts Medical Society, a fellow of the National Academy of Arts and Sciences and a member of the National Tuberculosis Association, the American Association of Pathologists and Bacteriologists, the Society of American Bacteriologists, the American Public Health Association, the Society of Experimental Biology and Medicine and the American Association of Immunologists. During the War, he served as a captain in the Sanitary Corps. He had been a member of the editorial board of the *New England Journal of Medicine* for many years.

He is survived by his widow, Nona (Solari) White, whom he married in 1935.

MISCELLANY

CHICAGO TUMOR INSTITUTE

The Chicago Tumor Institute, a nonprofit organization, located at 21 West Elm Street, Chicago, was opened March 21. It offers consultation service to physicians in the diagnosis and treatment of cancer and radiation facilities for cancer patients. The institute also proposes to conduct research and to offer training to physicians who may wish to qualify as specialists in the study and treatment of this disease.

The members of the Scientific Committee are: Max Cutler, M.D., director; Sir G. Lenthal Cheatle, F.R.C.S.; Henri Coutard, M.D.; Arthur H. Compton, Ph.D.; and Ludvig Hektoen, M.D. The Board of Trustees is composed of the following: Ludvig Hektoen, president; Arthur H. Compton, vice-president; Roy C. Osgood, treasurer; Modie J. Spiegel; Mrs. Francis Neilson; Mrs. Arthur Meeker; Alfred Busiel; and Max Cutler.

NOTES

The Council of Child Neurology Research announces that applications for grants will be considered at the meetings to be held in April and October of each year. The purpose of the council is to encourage original research on the definite problems coming within the scope of child neurology and allied fields. Applications must be in the hands of the director, Dr. Bernard Sachs, 116 West 59th Street, New York City, before April 1 and September 15. The applicant must state distinctly the problem under investigation and the methods to be pursued.

The trustees of Tufts College have established a laboratory for research in sensory psychology and physiology, which will be under the direction of Dr. Leonard Carmichael, who was recently elected president of the college. Bertram Wellman, now research associate in psychology at the University of Rochester, an expert in the application of electrical technics to psychological and physiological problems, will become assistant director of the laboratory.

Among honorary degrees conferred by Boston University on March 14, Founders' Day, was the doctorate of science on Dr. William E. Chenery, laryngologist and trustee of Boston University.

CORRESPONDENCE

CANCER MONTH

To the Editor: In connection with the national observation of April as cancer month, the Massachusetts Cancer Program will publicize routine work that is being done throughout the year. In addition to this, a few extra radio broadcasts will be given, and at the completion of one of the regular cancer clinics at each of the twenty-one state-aided clinics, a special cured-cancer clinic will be given. During the first six years of the cancer program approximately one thousand individuals appeared at the clinics who have now been free from cancer for five years or more. About three hundred of these will be present at the special clinics. The following is a schedule of the clinics:

Cancer Clinic	*Date and Hour*	*Consultant*
Beth Israel	April 21, 11:00 a. m.	Staff of Beth Israel.
Boston Dispensary	April 29, 11:30 a. m.	Staff of Dispensary.*
Brockton	April 12, 11:00 a. m.	Dr. Thomas Anglem.
Cape Cod-Hyannis	April 26, 4:00 p. m.	Dr. W. M. Shedden.
Fall River	April 28, 11:00 a. m.	Dr. J. V. Meigs.
Fitchburg	April 5, 10:00 a. m.	Dr. Ernest Daland.
Gardner	April 8, 10:00 a. m.	Dr. L. S. McKittrick.
Gloucester	April 20, 10:00 a. m.	Dr. E. P. Hayden.
Greenfield	April 1, 10:00 a. m.	Dr. Richard Wallace.
Lawrence	April 26, 10:00 a. m.	Dr. C. C. Simmons.
Lowell	April 27, 6:00 p. m.	Dr. H. Martin, N. Y.
Lynn	April 22, 10:00 a. m.	Dr. E. M. Daland.
New Bedford	April 13, 4:00 p. m.	Staff of St. Luke's.
Newburyport	April 5, 10:00 a. m.	Dr. C. C. Franseen.
North Adams	April 28, 4:00 p. m.	Dr. Charles Lund.
Northampton	April 21, 4:00 p. m.	Dr. C. C. Simmons.
Pittsfield	April 26, 4:00 p. m.	Dr. E. M. Daland.
Pondville	April 20, 3:00 p. m.	Dr. Daland and staff.
Springfield	April 1, 4:00 p. m.	Dr. A. W. Oughterson, New Haven.
Westfield	April 13, 4:00 p. m.	Dr. Daland and staff.
Worcester	April 27, 10:30 a. m.	not decided.

*With Dr. H. M. Clute and Dr. G. W. Taylor as consultants.

Every community in which a Co-operative Cancer Control Committee has been organized will have some of its member organizations invite a local physician to speak during the month. It is estimated that there will be upward of one thousand such meetings, with a combined attendance of nearly twenty thousand individuals.

Special radio broadcasts on cancer will be given. The following is a schedule of these talks:

WAAB. April 6, 8:15 p. m. "Public Health Aspects of Cancer" by Henry D. Chadwick, M.D.

WEEI. April 8, 4:15 p. m. "Fallacies and Facts About Cancer" and "Cancer Control" by Lila O. Burbank, M.D.

WAAB. April 13, 8:15 p. m. "Cancer: The disease" by Joseph C. Aub, M.D.

WEEI. April 15, 7:30 p. m. "Cancer" by Shields Warren, M.D.

For several years Dr. Lombard has been making a study of the familial aspects of cancer; his report is completed and will be published in the *New England Journal of Medicine* during the month.

For the past five years work has been progressing on the preparation of a satisfactory code to transcribe the cancer statistical data to punch cards so that the statistical analysis may be facilitated. This is a pioneer type of work, and we have no knowledge of its having been done elsewhere. The completion of this undertaking marks an epoch in the field of cancer statistics. Requests for the completed code have already come from several cancer hospitals in different parts of the country. April will mark the beginning of the transcription of these records to the permanent punch cards.

Throughout the program, the medical profession has cooperated with the department in furnishing advice, in helping with the cancer clinics, in speaking before the public, and in giving unstintedly of enthusiastic support. I take this opportunity of expressing my sincere appreciation.

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

State House,
Boston, Massachusetts.

SUSPENSION OF LICENSE

To the Editor: This is to inform you that at the meeting of the Board of Registration in Medicine held March 17, it was voted to suspend for six months the license of Dr. Solomon Gobert, 141 Meridian Street, East Boston, because of testimony in court.

STEPHEN RUSHMORE, M.D., *Secretary,*
Board of Registration in Medicine.

State House,
Boston, Massachusetts.

CHICAGO MEDICAL SOCIETY SPECIAL

To the Editor: We are writing to call attention of the members of the Massachusetts Medical Society to the operation of a "Chicago Medical Society Special" train from Chicago to San Francisco in connection with the American Medical Association sessions in June. Our train will be routed over the Milwaukee Road from Chicago to Omaha, Union Pacific to Ogden, and Southern Pacific to San Francisco, leaving Chicago from the Union Station at 9:00 p. m., Thursday, June 9, arriving San Francisco at 8:30 a. m., June 12.

The "Chicago Medical Society Special" will be composed of the most modern type, air-conditioned Pullman sleeping car equipment, with lowers, uppers, compartments, drawing rooms, and single and double bedrooms, and will have all the refinements that one can find on a high-grade train. It will be operated on a fast schedule, and there will be no excess fare involved, regular passenger fares applying from your home town.

If your Society does not contemplate the operation of a special train, the members of your organization are cordially invited to travel to San Francisco on this train with us. We feel confident that they will enjoy the privi-

lege of traveling with professional friends on our "Special." A little later on, a printed itinerary will be issued in which interesting variations of return routes will be briefly outlined.

We hope we may have the privilege of having a good many of your members with us and all reservations will receive our most careful attention.

FRANK P. HAMMOND, *Chairman,*
HOMER K. NICOLL,
Transportation Committee,
VICTOR L. HITZFELD, *Chairman,*
Train Arrangements.

30 North Michigan Avenue,
Chicago, Illinois.

BLOOD SAMPLES
FOR SUGAR DETERMINATIONS

To the Editor: Bloods submitted to laboratories for the determination of blood sugar are often valueless due to a misunderstanding of the proper way of preserving such specimens. Potassium oxalate prevents clotting of blood but does not prevent glycolysis. If analyses of blood for sugar cannot be made immediately, or within an hour after the blood is taken, a preservative must be added. A crystal of thymol, a drop or two of formalin, or a few milligrams of sodium fluoride are preservatives commonly employed. At this laboratory the preservative used is sodium fluoride. A mixture of 20 mg. of potassium oxalate and 50 mg. of sodium fluoride will prevent clotting and glycolysis of 10 cc. of blood for at least five days at icebox temperature, and for about three days at normal room temperature. A few crystals of potassium oxalate and as much sodium fluoride as will fit easily on the tip of a penknife is equally effective.

HAZEL M. HUNT, *Director,*
Chemical Laboratory.

New England Deaconess Hospital,
Deaconess Road,
Boston, Massachusetts.

REPORT OF MEETING

THE HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on January 11. Dr. C. Sidney Burwell presided.

The first case to be presented was that of a 44-year-old Italian chef who had come to this country at the age of 6. Before that time he had lived in his father's tavern in Italy. Ten years before entry he had had an attack of mild epigastric pain. Four and a half years before entry he suddenly became "black" and fainted. He was studied at that time, and a cholecystectomy done. Since then he had had intermittent bouts of jaundice, epigastric pain and clay-colored stools. In October of last year, 3 months before entry, he had had a similar but more severe attack and was admitted to the Peter Bent Brigham Hospital. The liver was found to be 2 cm. below the right costal margin and a circular shadow was seen in the right lobe of the liver by x-ray. An eosinophilia of 25 per cent was present and the skin test for echinococcus disease was positive. He was sent home and reentered in December for operation. Many adhesions and a mass in the head of the pancreas were found, and on irrigation of the common duct, daughter echinococcus cysts were recovered. A drain was inserted into the common duct and the abdomen closed. Following operation there has been irregular, intermittent drainage of gelatinous material containing daughter cysts. Dr. Cutler discussed the case and pointed out that this patient had a typical history of this condition and that the attack of cyanosis and unconsciousness were due to the anaphylactic shock which accompanies the rupture of the mother cyst.

A 48-year-old Lithuanian was presented as the second case. Her chief complaint on entry was orthopnea and dyspnea of 4 months' duration. Her sister had had rheumatic heart disease and her husband rheumatic fever. The patient gave a history of pneumonia at the age of 14 followed by joint pains for 3 months. At the age of 31, in her fourth pregnancy, she was found to have the signs of mitral stenosis and regurgitation with mild decompensation. At this time she was seen by Dr. Paul D. White and was followed by his clinic for 5 years. She did well until 4 years before entry when she again became decompensated and had ascites and pleural effusion. In August, 1937, she again showed evidence of cardiac failure and was admitted to the Peter Bent Brigham Hospital in December for similar symptoms. Physical examination at that time showed an emaciated, dark-skinned woman, dyspneic and with considerable congestion of the neck veins. There were signs of a bilateral pleural effusion. The left border of dullness of the heart was 12 cm. to the left of the midsternal line. The mitral first sound was accentuated, with a systolic and presystolic murmur present in this area. A systolic and a short early diastolic murmur were present at the base, and she was fibrillating at an apical rate of 60. The blood pressure was 120/70. Thrills could be felt over both apex and base. The abdomen was distended and a right-upper-quadrant mass pulsated expansilely. Edema of the legs and over the sacrum was present. Laboratory data showed evidence of kidney congestion, and the venous pressure was 140 mm. of water in both arms. An electrocardiogram showed right-axis deviation and auricular fibrillation. X-rays of the chest demonstrated fluid on the right and a markedly enlarged heart with a prominence along the left border typical of rheumatic heart disease; calcified valves were seen.

Doctors Burwell, White and Levine discussed the case and pointed out the probability of tricuspid stenosis in a case with such long-standing systemic failure. A patient with involvement of the aortic, mitral and tricuspid valves has a more favorable prognosis than one with aortic or mitral lesions alone. A large liver over a period of years in a case of rheumatic heart disease should make one suspect tricuspid-valve involvement.

Dr. Burwell introduced the speaker of the evening, Dr. Paul D. White, who presented the history of the development of our knowledge of the cardiovascular system and its diseases. For the past few years Dr. White has made this a hobby and has collected many of the early editions of the authors who have made substantial additions to such knowledge. He displayed many of these volumes. Dr. White has also devised a chart showing the development of knowledge of the circulation from century to century. He has divided this chart into two parts: on the left he has shown the developments in anatomy and physiology and on the right side in parallel fashion he has put pathology and medicine, thus effectively showing the importance of knowledge of the fundamental medical sciences before advances in clinical medicine are made.

The science of hygiene was an important part of early medicine and the earliest written medical records also speak of the use of squill and opium. The Alexandrian school increased anatomical knowledge considerably. In 30 A.D., Celsus summarized medical knowledge which had been accumulated up to that time. Dioscorides in

60 A.D. wrote a work on materia medica that was the authority on the subject until relatively modern times. Galen (born about 131 A.D.) studied the heart and arteries in animals, wrote about the pulse, and was acquainted with all of the arrhythmias. Medical schools were founded in Italy around 1100 A.D. These were the important contributions before 1500.

In the sixteenth century autopsies began to be done; cases of pericarditis and big hearts were described, and the relation of aneurysms to syphilis was recognized. It was then gradually realized that heart disease as such could exist; before that time such a possibility was not admitted, doubtless largely because postmortem examinations had not been made. Vesalius published his epochal anatomy in 1543 and gave a description of the heart and circulation, including briefly the coronaries. In the seventeenth century the first treatise on heart disease was written, the valves of the veins were described, Harvey wrote his monumental work on the circulation of the blood (1628), the thoracic duct was discovered, and Malpighi described the capillaries (1661). Toward the end of the century (1679) Bonetus published his important work *Sepulchretum*, an extensive compilation of autopsies done up to that time.

In the first half of the eighteenth century three authoritative books on heart disease were written (Vieussens, 1715; Lancisi, 1728; Senac, 1749). During this century many important contributions were made. The coronary circulation was described as well as the cardiac nerve supply. The first blood-pressure study was made by Hales in 1733. The use of percussion in the physical examination of the chest was first described by Auenbrugger (1761), Withering introduced foxglove for dropsy (1785), and angina pectoris as a clinical entity was recognized by Heberden (1768). Pulmonary vascular congestion in mitral stenosis was described by Vieussens (1715), engorgement of the veins of the neck in dilatation of the right-heart chambers by Lancisi (1728), and quinine for obstinate palpitation and venesection for pulmonary edema were advised by Senac (1749). Cases of heart block with syncope were described by Morgagni (1761) and confirmed in the next century by Adams and Stokes. Jenner, about 1775, recognized the connection between angina pectoris and coronary disease, confirmed by Parry in 1799.

In the nineteenth century many more contributions made their first appearance. In 1806 Corvisart published his classical book on heart disease. In 1815 Hodgson wrote on vascular disease. Mediate auscultation and the stethoscope were introduced by Laennec in 1819, and in 1825 Stokes in Great Britain advised the use of the stethoscope. In 1832 Hope described left ventricular failure and cardiac asthma. In 1836 Williams wrote on nervous palpitation, reviving the ancient view of Galen and his contemporaries. In 1842 Chevers described a case of chronic constrictive pericarditis and explained its pathogenesis. In 1858 Peacock wrote the first book on congenital malformations of the heart. In 1872 Gull and Sutton described arteriolar sclerosis, and in 1878 Welch produced pulmonary edema experimentally. The first human electrocardiogram was taken in 1887 by Waller. X-ray examination of the chest was made in 1896, a few months after the introduction of this method of study by Roentgen; in that year Francis Williams of Boston demonstrated an x-ray picture of the heart in Washington at the spring meeting of the Association of American Physicians.

From 1900 on, Dr. White found it very difficult to pick out the most important contributions because of the wealth of material and the closeness to our own time. Among those he chose are: Mackenzie's studies of the pulse, Wenckebach's work on cardiac arrhythmias, Krogh's study of the capillaries, investigations of blood pressure, the modern electrocardiograph (first introduced by Einthoven in 1903), Lewis's study of the mechanism of the heart beat, the description of coronary thrombosis by Herrick in 1912, Cabot's contribution on the etiology of heart disease in 1914, and the establishment of cardiac specialization and of the heart journals in various countries in the last two decades.

NOTICES

ANNOUNCEMENT

JOSIAH E. QUINCY, M.D., announces that, beginning April 1, he will continue the practice of the late Dr. Charles Day at the same address, 270 Commonwealth Avenue, Boston.

FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and other interested members of the medical profession on Thursday, April 7, at 5:00 p. m.

There will be a discussion of cases by Dr. Burton E. Hamilton and Dr. Charles P. Sheldon.

J. B. HAZARD, M.D., *Secretary*.

AMERICAN NEISSERIAN MEDICAL SOCIETY

The fourth annual session of the American Neisserian Medical Society will be held in Washington, D. C., on May 16 and 17 in the Public Health Auditorium located at 19th Street and Constitution Avenue, N. W.

The session will open with a symposium on sulfanilamide, which will be timely and of great value to everyone. Dr. Perrin H. Long, of the Johns Hopkins Hospital, will deliver the principal address. Dr. Long's work puts him in the position of being the country's leading authority on the chemistry, mode of action and clinical use of sulfanilamide. Following the presidential address in the afternoon there will be simultaneous meetings of the three following sections: Male Clinical, Female Clinical, Laboratory and Research. The Male Clinical Section will discuss in considerable detail the question of nomenclature, standard record forms, diagnosis and cure. The Female Clinical Section will discuss diagnosis and cure. The Laboratory and Research Section will discuss bacteriology, serology and research. The reports of these deliberations as accepted on the following day will become the society's official opinion and will serve as authoritative information which when disseminated will undoubtedly result in clarifying some of the present needless confusion. This would seem to be an important step toward improving the management and control of gonorrhea. The chairmen of the sections desire all possible assistance from the members, who are urged to attend and take an active part in the deliberations of the section meeting most in line with their interests.

The second day will open with the business meeting following which the sections will submit their reports. There will be ample opportunity for generous discussion before the reports are accepted. The final afternoon will be devoted to the presentation of some extremely interesting papers.

OSCAR F. COX, M.D., *Secretary*.

REMOVAL

GEORGE W. PAPEN, M.D., announces the removal of his office to 31 Milk Street, Room 1020, Boston.

TUFTS ALUMNI LECTURE

The annual alumni lecture of the Tufts Alumni Association will be held at the Tufts College Medical School, on Wednesday, April 6, at 4:00 p. m.

Dr. George W. Holmes, roentgenologist to the Massachusetts General Hospital and clinical professor of roentgenology at Harvard, will speak on "Pulmonary Bleeding: Its cause and diagnosis with special consideration of the roentgenological findings."

Medical students and physicians are cordially invited to attend.

HARRY BLOTNER, M.D., *Secretary.*

EASTERN HAMPDEN MEDICAL ASSOCIATION

Because of conflict with the Thursday evening lecture of the Postgraduate Extension Course, the next monthly meeting of the Eastern Hampden Medical Association will be held on Wednesday, April 6, at 4:45 p. m., at the Oaks Hotel, Springfield.

Dr. R. E. Dickson, of Holyoke, will present the scientific paper entitled "Undulant Fever." Case reports will be given by Dr. Edith E. Baldwin and Dr. H. F. Cleveland.

The medical profession is cordially invited to attend.

J. JOSEPH KLAR, M.D., *Secretary-Treasurer.*

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9-10 a. m.

MEDICAL CONFERENCE PROGRAM, APRIL, 1938

Friday, April 1 — Specific Therapy for Certain Anemias of Childhood. Louis K. Diamond.

Saturday, April 2 — Pneumonia. Dr. Joseph H. Pratt.

Tuesday, April 5 — Diagnosis and Treatment of Certain Bone Tumors. Dr. John D. Adams.

Wednesday, April 6 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Thursday, April 7 — Social-Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy.

Friday, April 8 — The Pathogenesis of Pulmonary Edema. Dr. Sidney Farber.

Saturday, April 9 — Management of Acute Empyema. Dr. Henry L. Cabitt.

Tuesday, April 12 — Vitamin A Deficiency in Adults. Dr. Harold J. Jeghers.

Wednesday, April 13 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Thursday, April 14 — Transurethral Prostatic Resection. Dr. P. N. Papas and Dr. Harold A. Chamberlin.

Friday, April 15 — Acid-Base Balance in Health and Disease. Dr. John H. Talbott.

Saturday, April 16 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Wednesday, April 20 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Thursday, April 21 — Follow-up of Interesting Diagnostic Problems: Presentation of former Diagnostic Hospital patients. Dr. H. G. Brugsch.

Friday, April 22 — Surgery of Peripheral Vascular System. Dr. James C. White.

Saturday, April 23 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Tuesday, April 26 — Clinicopathological Conference. Dr. R. C. Wadsworth and Dr. Cadis Phipps.

Wednesday, April 27 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Thursday, April 28 — The Significance of the Heterophile Agglutination Test. Dr. Peter Beer.

Friday, April 29 — Social Security. Professor E. B. Wilson.

Saturday, April 30 — Hospital Case Presentation. Dr. S. J. Thannhauser.

SYMPOSIUM IN HONOR OF DR. JELLIFFE

The thirty-fifth anniversary of Dr. Smith Ely Jelliffe's editorship of the *Journal of Nervous and Mental Diseases* will be celebrated at the New York Academy of Medicine on April 22.

A neuropsychiatric symposium will be opened by Dr. Adolph Meyer at two o'clock in the afternoon; Dr. Jelliffe will preside. The scheduled speakers and subjects are as follows: Dr. Earl D. Bond, "Balance in Psychiatric Research"; Dr. George Draper, "The Man Factor in Disease"; Dr. Frederick Tilney, "New Interpretation of the Hippocampus"; Dr. Oskar Diethelm, "Psychiatry and Neurology in the Last Fifty Years"; Dr. Karl Menninger, "Somatic Correlations with the Unconscious Repudiation of Femininity in Women." This will be followed by a dinner in the evening, at which Dr. Foster Kennedy will be toastmaster; the speakers include Drs. Abraham A. Brill, Louis Casemajor, Henry A. Riley and Richard H. Hutchings.

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

The next meeting of the Wachusett Medical Improvement Society will be held at the Holden District Hospital, on Wednesday evening, April 6. Dinner at 6:30 will be followed by a business meeting at 7:30.

SCIENTIFIC PROGRAM

The Administrative Side of the Hospital. Dr. G. A. MacIver, superintendent of Worcester City Hospital, and Dr. G. H. Stone, superintendent of the Memorial Hospital.

Irrigation vs. Vaccine vs. Sulfanilamide in the Treatment of Gonorrhea. Dr. N. S. Scarcello, junior urologist, Worcester City Hospital.

WALTER D. BIEBERBACH, M.D., *President,*
NICHOLAS S. SCARCELLO, M.D., *Secretary.*

GREATER BOSTON MEDICAL SOCIETY

There will be a meeting of the Greater Boston Medical Society at the Beth Israel Hospital Auditorium on Tuesday, April 5, at 8:30 p. m.

Dr. Louis Nahum, assistant professor of physiology at the Yale University School of Medicine, will speak on "Comments on the Coronary Arteries from the Clinical Standpoint with Special Reference to Prognosis."

K. C. ROSEN, M.D., *President,*
D. B. STEARNS, M.D., *Secretary.*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The annual meeting of the New England Dermatological Society will be held on Wednesday afternoon, April 13, at the Boston City Hospital in the Skin Outpatient Department at 3:00.

BERNARD APPEL, M.D., *Secretary.*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, APRIL 4

MONDAY, APRIL 4

*4 p. m. Physicians and medical students are cordially invited to attend a clinic presented by the medical, surgical and orthopedic services of the Infants' and Children's hospitals, in the amphitheater of the Children's Hospital.

TUESDAY, APRIL 5

*9-10 a. m. Boston Dispensary. Diagnosis and Treatment of Certain Bone Tumors. Dr. John D. Adams.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

11:30 a. m. John T. Bottomley Society, Carney Hospital Outpatient Department.

8:30 p. m. Greater Boston Medical Society. Auditorium of Beth Israel Hospital.

WEDNESDAY, APRIL 6

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser.

*12 m. Clinicopathological conference. Children's Hospital amphitheater.

*4 p. m. Tufts Alumni Lecture. Tufts College Medical School.

THURSDAY, APRIL 7

*9-10 a. m. Boston Dispensary. Social-Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy.

5 p. m. Faulkner Hospital, clinicopathological conference.

FRIDAY, APRIL 8

*9-10 a. m. Boston Dispensary. The Pathogenesis of Pulmonary Edema. Dr. Sidney Farber.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

SATURDAY, APRIL 9

*9-10 a. m. Boston Dispensary. Management of Acute Empyema. Dr. Henry L. Cabitt.

*10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

SUNDAY, APRIL 10

4 p. m. Illustrated, public, health lecture, Faulkner Hospital auditorium. Common Foot Ailments and Their Significance. Dr. Lloyd T. Brown.

*Open to the medical profession.

APRIL 1-8 — Springfield District Teaching Clinics. Page 499, issue of March 17.

APRIL 1-30 — Boston Dispensary, Medical Conference Program. Page 583.

APRIL 4-8 — The American College of Physicians. Page 41, issue of July 1.

APRIL 5 — Greater Boston Medical Society. Page 583.

APRIL 5 — John T. Bottomley Society, 11:30 a. m., Carney Hospital Outpatient Department.

APRIL 6 — Tufts Alumni Lecture. Page 583.

APRIL 6 — Wachusett Medical Improvement Society. Page 583.

APRIL 6 — Eastern Hampden Medical Association. Page 583.

APRIL 7 — Faulkner Hospital, clinicopathological conference. Page 582.

APRIL 13 — New England Dermatological Society. Notice above.

APRIL 13 — New Bedford Cancer Clinic. Page 546, issue of March 24.

APRIL 13 — Eastern Hampden Medical Association. Page 499, issue of March 17.

APRIL 14 — Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street, Haverhill, 8:30 p. m.

APRIL 18 — Boston Medical History Club. Boston Medical Library, 8 Fenway, Boston.

APRIL 18, 19 and 20 — Thomas William Salmon Memorial Lectures. Page 450, issue of March 10.

APRIL 22 — Symposium in Honor of Dr. Jelliffe. Page 583.

APRIL 23 — Massachusetts Memorial Hospitals, annual reunion of house officers' alumni association. Page 546, issue of March 24.

APRIL 26 — New England Society of Psychiatry. Page 322, issue of February 17.

MAY 16 and 17 — American Neisserian Medical Society. Page 582.

MAY 31, JUNE 1 and 2 — Annual meeting of the Massachusetts Medical Society. Hotel Bradford, Boston.

JUNE 6, 7, 8, and 9 — American Association of Industrial Physicians. Page 499, issue of March 17.

JUNE 13-17 — American Medical Association. San Francisco.

JUNE 13, OCTOBER 8 and NOVEMBER 15 — American Board of Ophthalmology. Page 282, issue of February 10.

SEPTEMBER 12-14 — American Association for the Study of Goiter. Page 545, issue of March 24.

OCTOBER 17-21 — Clinical Congress of the American College of Surgeons, New York City.

OCTOBER 24-26 — Academy of Physical Medicine, Scientific Session. Washington, D. C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5 — 5 p. m., New Bedford.

ESSEX SOUTH

APRIL 6 — Gloucester Hospital, Gloucester. Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

MAY 5 — Censors meet at Salem Hospital, 3:30 p. m.

MAY 11 — Annual meeting, Salem Country Club, Peabody. Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meeting will be held at the Franklin County Hospital, Greenfield, at 11 a. m. the second Tuesday of May.

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July.

HAMPSHIRE

MAY 11 — Page 546, issue of March 24.

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club, Stoneham, at 12:15 p. m. on May 11.

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club, Lowell, on April 27.

NORFOLK DISTRICT

MAY — Annual meeting.

The censors meet on the first Thursdays of May and November in each year.

NORFOLK SOUTH

Meetings held at 12 noon.

APRIL 7 — At the Quincy City Hospital.

MAY 5 — Annual meeting.

PLYMOUTH

Meetings will be held at 11 a. m. on April 21, May 19 and July 21.

WORCESTER

APRIL 13 — Hahnemann Hospital, Worcester. Dinner will be at 6:15, to be followed by business session and scientific program.

MAY 11 — Afternoon and evening, annual meeting. Place and schedule of program to be announced.

BOOKS RECEIVED FOR REVIEW

Short Years: The life and letters of John Bruce MacCallum, M.D., 1876-1906. Archibald Malloch. 343 pp. Chicago: Normandie House, 1938. $3.50.

Index Médico-Pharmaceutique. N. T. Deleanu, René Fabre and L. Coniver. 756 pp. Paris: Masson et Cie, 1937. 120 Fr. fr.

Macleod's Physiology in Modern Medicine. Edited by Philip Bard et al. Eighth edition. 1051 pp. St. Louis: The C. V. Mosby Company, 1938. $8.50.

Transactions of the American Association of Genito-Urinary Surgeons. Vol. 30. 417 pp. Saint Paul and Minneapolis: The Bruce Publishing Company, 1937. $2.50.

Pavlov and His School: The theory of conditioned reflexes. Y. P. Frolov. 291 pp. New York: Oxford University Press, 1937. $4.00.

Studies from the Rockefeller Institute for Medical Research. Reprints. Volume 105. 620 pp. New York: The Rockefeller Institute for Medical Research, 1937. $2.00.

BOOK REVIEWS

Primary Carcinoma of the Lung. Edwin J. Simons. 263 pp. Chicago: The Year Book Publishers, Inc., 1937. $5.00.

This book is an exhaustive study of the more than 550 articles comprising the literature on primary carcinoma of the lung. In all, about 5000 proved cases are mentioned in the literature, but most of the tables in the present work concern only parts of this total number.

From his study, the author draws the following conclusions. There has been a real and not merely an apparent increase of pulmonary carcinoma. Fourteen possible etiologic agents have been mentioned, all of which produce chronic pulmonary irritation. Macroscopically, pathologic specimens may be hilar or peripheral; histologically, the cases may be grouped under (1) squamous cell; (2) adenocarcinoma; (3) undifferentiated round or spindle-cell growths. All three types originate from one parent cell — the undifferentiated basal cell of the bronchial epithelium. The so-called Pancoast tumor is simply pulmonary carcinoma in a peculiar location. In most cases pleural "endothelioma" is metastatic carcinoma. The right and left upper lobes are almost equally involved, but the right lung more frequently than the left if all the lobes are taken into account. Metastases occur in the order of decreasing frequency in the following organs: regional lymph nodes, liver, lungs, bones, kidneys, adrenals, pleurae, brain, pericardium, pancreas, cervical nodes, heart, thyroid and spleen. Eighty per cent of pulmonary carcinoma occurs in males. Eighty per cent of all cases occur between the ages of forty and seventy. There are only fourteen cases reported in persons nineteen years of age or younger. The symptoms arranged in order of decreasing frequency are as follows: cough, expectoration, pain, dyspnea, emaciation, fever, hemoptysis, dilated chest veins, cyanosis, edema and night sweats. The author then goes on to discuss signs, special laboratory examinations, roentgenological appearance, and finally, treatment.

Thirty pages of tables do not convince the reviewer of the truth of the first conclusion, but the rest are in line with accepted opinion.

The work is advertised as a book by a general practitioner for general practitioners, but it will find its principal use as a reference work for physicians and surgeons who are specializing in diseases of the lung. Most general practitioners will get what they need in a shorter time by reading one or two of the briefer articles by outstanding authorities in the field.

The work lacks force because the writer has had very little clinical experience with the condition he is discussing, and has no sound basis for evaluating the statements of other writers. But the literature is very well surveyed, and the book will be of real value to all who are interested in the subject.

Physiological Chemistry of the Bile. Harry Sobotka. 202 pp. Baltimore: The Williams & Wilkins Company, 1937. $3.00.

This volume should be an extremely useful reference book for those who are interested in the study of biliary-tract physiology. The title is somewhat misleading, inasmuch as the physiology of the bile pigments is not considered, but the author justifies their exclusion from this volume because of the extent of the subject. He very justly points out the vastness of the literature on the subject of biliary secretion, with the comment that its "extensiveness is more imposing than its depth." It is obvious that he has attempted to clarify many of the discrepancies to be found in the clinical and experimental studies of bile acids, and he has succeeded extremely well. With a great deal of care he points out that bile-fistula studies, because of varying technics, cannot be readily correlated. In some instances, for example, a bile fistula has been a gall-bladder fistula with its striking factor of concentration, while at other times it has truly represented a hepatic or common-duct fistula with its more diluted hepatic secretion.

Careful definitions of cholagogic action, choleresis and cholagenesis are timely, and are important contributions to a much confused conception of biliary-tract physiology. The discussion of the effect of bile acids on these functions, as well as on the processes of digestion and enzyme activity, on micro-organisms and in immune reactions, together with that of the pharmacologic action of bile salts, is complete and interesting. The complex chemistry of the bile acids is well presented but leaves the reader more or less in a state of confusion, probably because clarity in this field is still an impossible achievement.

In addition to the excellent summary on the choleretic action of bile acids, it is interesting and pleasing to read a fairly authoritative review on the cholagogic and choleretic effects of various drugs. Calomel is neatly laid in its grave as an inert substance, so far as being a secretory stimulant is concerned. Data on the physiologic activity of dehydrocholic acid (decholin) are given in full, and are of real interest. It is a matter of regret that the clinical use of this preparation has not fulfilled the estimates of its usefulness, as suggested by experimental data.

The author has done well to bury another ghost, namely the therapeutic effect of oil administered orally in dissolving or evacuating gallstones.

Without doubt the book is essentially a complete exposition of the literature on the various aspects of bile acids, and the voluminous bibliography of forty-four pages is an imposing one. The author indulges in no verbiage, and does much in his comments to clarify a distinctly difficult and confusing subject. Futile speculation on most points he labels as such. For the practitioner the volume is detailed and arrives at too few definite conclusions to offer immediate practical aid. The rare clinical observations are not always on a par with the general excellence of the book. To the investigator the book should prove an invaluable source of information and comment on a most interesting but bewildering subject.

Practical Proctology. Louis A. Buie. 512 pp. Philadelphia and London: W. B. Saunders Company, 1937. $6.50.

The author has presented a most complete and convincing exposition of diseases of the anus and rectum, based largely on his own tremendous experience. Throughout the entire book there is very clear evidence of careful analysis of the facts obtained from innumerable observations made over a period of years. There is also a very distinct and comforting attitude of practical common sense that makes the volume an excellent basis for reference.

The author states: "In the past ten years once every two days a paper on disease of the colon, rectum or anus has appeared in some accredited medical journal." Amid much that is confusing in all these articles, his book stands out with extreme clarity in all its details. He stresses throughout the importance of careful examination and absolute insistence that any rectal lesion should be considered malignant until proved otherwise. The anatomical descriptions in the book are very clear and are given in great detail.

Surgical technic is described in detail but is easily read. At times the author is rather caustic in his criticism of various maneuvers but always justifiably so. Traditional methods are scrutinized carefully and are frequently discarded because of their complete lack of rationality. In commenting on surgical methods he quite rightly says: "One can only describe technic; it cannot be taught."

Certain statistical facts are of interest and are clearly presented. The traditional conception that anal fistula and tuberculosis are commonly associated is convincingly disproved. The use of dilators is frequently, and quite properly, condemned. The supposed relation of retroversion of the uterus to anal and rectal disturbances is clearly discussed and discarded. The entire discussion of hemorrhoids, including the injection method of treatment, is very fairly and successfully presented. The chapter on anal pruritus is a masterpiece, and describes the patient, his complaints and their treatment in a manner that can only be based on an unusual experience.

The chapter on polyps is complete, and quite properly the author insists upon radical treatment of all such lesions because of the subsequent danger of cancer. Factitial ulcer of the rectum due to radiation of pelvic organs receives adequate attention, and it is important that this frequently overlooked sequel to what may have been a necessary therapeutic procedure is properly emphasized.

The chapter on ulcerative colitis is of interest, and from the point of view of description, leaves nothing to be desired. Remarks upon treatment and prognosis are worded with extreme caution, however, and consist largely in quotations from others. The author has quite wisely refrained from discussing end results in what is obviously a controversial subject.

Syphilis as a traditional cause for rectal stricture is fairly shown to be almost a negligible factor. Lymphopathia venerea is extremely well described, particularly in its relation to stenosing lesions in the rectum, but one wonders why it is differentiated from lymphogranuloma inguinale.

Adverse criticism can find little place in a discussion of this book. The attitude of the writer is always that of a surgeon but is consistently conservative and always convincing. One regrets that there is very little appreciation of the functional disturbances which are so frequently encountered by medical men. This is reflected, for example, in the dietary suggestions for treatment of constipation, which, according to the author, should consist of high-residue or high-roughage diets — a form of treatment which has been long known to be contraindicated in many cases.

Aside from such minor criticisms, there can be little question that the book is extremely valuable in every respect. The illustrations are numerous and well prepared. The volume is a distinct addition to the literature on the subject.

Concepts and Problems of Psychotherapy. Leland E. Hinsie. 199 pp. New York: Columbia University Press, 1937. $2.75.

The aim of this volume is to discuss and evaluate the general conceptions of psychotherapy in its relation to clinical psychiatry, particularly as based upon the current concepts of mental functioning. It raises important issues in the field of psychiatry.

The author points out that psychotherapy may be roughly divided into ante-Freudian methods (suggestion, general discussion, hypnosis), and the Freudian method of psychoanalysis with its complicated theoretical ramifications and practical therapeutic application. In psychoanalysis, the concepts of analytical psychology (Jung) and of individual psychology (Adler) had their origin; while psychobiology is a very general term which, according to Adolf Meyer, is an investigation of the interaction of human beings with various environments, and evaluates the activities and capacities of the individual.

There is a critical examination of the various schools of psychotherapy and a discussion of the difficulties of the evaluation of the results. It is pointed out that psychoanalysis can be used only in a small percentage of the total number of patients who seek or require it, partly due to the limited number of qualified analysts and partly because only certain types of cases seem amenable to analytic therapy. The best results of therapeutic analysis are obtained in the psychoneuroses, sexual perversions and inversions. The author suggests that psychotherapy must eventually submit its data to biometric analysis, such as has already been done in tuberculosis.

Chapter V, by Dr. Carney A. Landis, on the statistical evaluation of psychotherapeutic methods, appears to the reviewer to be one of the most valuable and practical sections for the physician. Here it is pointed out that any therapeutic method must satisfy several major considerations, that it must be rational and effective and that there must be a logical relation between the therapeutic agent employed and the result or cure. In psychologic medicine (psychotherapy) these considerations are difficult to evaluate for several reasons. The exact nature of nervous or mental disease is unknown. There may be a disagreement of opinion as to exact etiology (somatic, psychogenic, or both). The relation between therapy and result is less clear than in organic conditions, and finally, there is no uniformity of opinion as to what constitutes an amelioration or cure. Therefore, statistical figures in the field of psychotherapy have to be evaluated cautiously.

Several tables are given from various hospitals, arranged according to diagnostic groups. It is impossible to go into the details of these tables within the limits of a review, except to state that they show that for every ten patients in mental hospitals four are discharged as recovered or improved. The figures vary, of course, with sex, age level and type of mental disease. These figures are compared with reports from institutes which utilize specific psychotherapeutic methods. In the Berlin Psychoanalytic Institute, cases were termed recovered when the symptoms disappeared. The neuroses showed the best recovery rate. A few of the figures, relating to recovered cases or to those much improved, may be summarized as follows: Maudsley Hospital 67 per cent; Cassel Hospital 70 per cent; New York State Psychiatric Institute 87 per cent; Berlin Psychoanalytic Institute 58 per cent in all cases and 91 per cent in completed cases. These figures seem to show that no one type of intensive therapy is more effective than another.

While the author, as a rule, is cautious in discussing the various concepts in mental structure and function and how these influence different psychotherapeutic methods, yet the reviewer must point out that assembled statistics fail to give a genuine picture of what has been accomplished. In the opinion of the reviewer, there are certain neurotic disorders which can be handled without prolonged and deep therapy, provided their dynamic structure is understood, but it was not until the advent of psychoanalysis that such a dynamic evaluation of symptoms could be reconstructed. It must be emphasized that for the more severe and protracted psychoneuroses or character disorders, the therapy of choice is psychoanalysis, as most cases of this type, according to their clinical histories, have had other psychotherapeutic methods and have not been favorably influenced by this surface ploughing.